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Original Communications.

THE MANAGEMENT OF TYPHOID FEVER.

By H. G. McCormick, M.D., Williamsport, Pa.

In a discussion before my county society one year ago I made the statement that typhoid fever was not necessarily a self-limited disease, and I promised within a year to prove by a series of cases that this was practically true. During my term of service in the Williamsport Hospital in 1893 I treated twenty-one cases of typhoid fever that recovered. The average length of time these persons were sick was thirty-two and one-fifth days. They were treated by the usual methods,—baths, regulated diet, sulpho-carbolate of zinc,—with the idea that the disease was self-limited, and all that I could do was to carefully watch the symptoms. Besides this number, three died.

In 1894 I treated twenty-two cases, seventeen of which were treated by a different method and five by the old method. Of these five treated, one ran fifty-one days, one forty-four days, one twenty days, with a fourteen days' relapse, one thirty-two days, and one forty-three days, making the average thirty-nine days before the temperature reached normal. Of those treated by a different method,—seventeen in number,—the average was twenty and

ten-seventeenths days when the fever subsided.

It has been laid down in the works on practice that typhoid fever, as a rule, runs a course of from twenty-one to twenty-five days. This, I am satisfied, in my section of the country at least, is an error. The time is certainly much longer. Of the cases treated this year, there could certainly be no difference, for they all occurred in the same epidemic and were not selected cases. Some of those whose course was so prolonged bid fair in the beginning to be mild cases. They were selected without any regard to their severity.

An average of thirty-nine days is probably higher than the average of this disease, but by taking the average of the cases treated in 1893 and those treated in 1894 we will probably arrive at about a fair figure as to the duration of typhoid fever. This shows an average of thirty-five days. Now, if thirty-five days is the average duration of a case of typhoid, and if my seventeen cases treated this year show an average of twenty and ten-seventeenths days, I certainly have succeeded in reducing the duration of this disease fourteen or fifteen days. The longest any case ran treated by this method was thirty-four days, and this was in a man brought into the hospital on the eighth or ninth day of his sickness. The next highest was thirty-two days, in a man brought in on the eighth day. There were fourteen cases seen on the seventh day or before, and the average time these were sick was eighteen and a half days. Of those seen after the seventh day, under the same plan of treatment, the average duration of the disease was thirty-one days.

I am convinced that a statement I made before my county society, that typhoid fever prior to the sixth or seventh day was a local disease and might be aborted, has been proved conclusively by the above figures. Those cases whose duration was shortened were not lacking in severity. Three of them had hemorrhages, one violent delirium, one had chronic heart complication; there was one case of relapse.

It might be urged that these cases were not typhoid fever, and that I erred in their diagnosis. During the time these cases were being treated the hospital was being visited each day by members of the staff and other physicians. They frequently examined them, yet no question was ever raised by a single one that they were not cases of typhoid fever. Many of them were very marked cases. The one showing the shortest duration was one of the most marked of any. This case had rose spots, nosebleed, tympanitis, and gurgling in the right iliac fossa.

It has been taught in every text-book and by all teachers of medicine that typhoid fever is self-limited, and that under any plan of treatment, which were as varied as the individuals, there was no hope of shortening the attack. Professor Osler, in his work on practice, makes this statement: "The profession was long in learning that typhoid fever is not a disease to be treated by medicines." And an impression has gone forth throughout the whole profession that all that could be done in the management of these cases was to regulate the diet and treat them symptomatically. This, I believe, is an error.

Now as to the treatment. Calomel was given first each two hours until the bowels were thoroughly moved. Sometimes salts were substituted, and the bowels were kept moving from two to four times in twenty-four hours. In not a single instance was anything given to control the bowel movements. They were given internally, guaiacol 4 drops and eucalyptol 8 drops every three hours. Their diet consisted of milk, beef-tea, beef peptonoids, and buttermilk. Some of them were given stimulants, as the occasion demanded. If the circulation was weak, hypodermics of strychnine in $\frac{1}{30}$-grain doses was ordered every three hours. The colon was washed out each day. Water was given them in as large quantities as they desired. After the first week, when they became somewhat stupid, water was given them as regularly as their food. The injections into the bowels were given for a treble purpose: for cleanliness, for the reduction of temperature, and for nourishment. Frequently Peyer's glands in the colon become affected; Dr. Osler states in one-third of the cases. If this be true, then your enema, thoroughly washing out the colon, cleanses these inflamed glands and renders them aseptic. Frequently I have reduced the temperature from two to three degrees by washing out the colon with a quart or three pints of ice-water. Frequently I have used enemas containing salt in order that I might stimulate a lagging heart by the absorption of more fluid into the circulation. For the reduction of temperature I used only local applications of guaiacol. These applications were made over the right iliac region, and in not a single instance did they fail to reduce the temperature. This reduction would last from three to four hours. The stools were carefully disinfected. The patients were kept clean by a bath each day. When hemorrhage occurred they were given hypodermic injections of er-

gotol, and opium or morphine were carefully interdicted.

In a conversation which I had with a professor of practice in a leading medical college in this State within the last year, he said to me that he taught but one remedy in the treatment of hemorrhage in typhoid fever, and this was opium, or its alkaloid, morphine; that when a student came before him for final examination, if he gave other than this treatment for this trouble he believed him unfit to practise medicine, and so reported him to the faculty. I believe this man taught a great error. The principle upon which opium was given was that it controlled the peristaltic action of the bowels and rendered hemorrhage less liable. That it controls peristaltic action none will pretend to deny. But when it is controlling this action it is also drying up the secretions of the glandular system of the alimentary canal, the food taken decomposes, forms a gas, tympanitis follows, the bowel is put upon the stretch, and hemorrhage, of necessity, is more likely to occur, the weakened bowel, due to ulceration, is more likely to be perforated, and you are adding to the already complicated case another complication.

When hemorrhage occurred, besides giving the hypodermics, I gave a large enema of ice-water, which cleaned out the colon, stimulated contraction of the bowel, carried off the clots of blood,—a fruitful soil for propagating the poison,—and rendered the whole alimentary canal as nearly aseptic as possible. If the prostration was great following the hemorrhage, the transfusion of a warm salt solution quickly strengthened the heart's action, filled the blood-vessels with a fluid which went to nourish the body, and the patient rapidly rallied. In one case transfusion was performed five times, in another four times, in another three, and in another one. All the cases recovered.

There was one peculiarity noticed in the treatment of all these cases, and that was, they were perfectly free from tympanitis and their tongues were moist throughout the disease. Lobar pneumonia followed in one case after the temperature had been normal four days. This was quickly relieved by packing the affected side in ice for thirty-six hours.

It has been the practice of some physicians to use phenacetin, acetanilide, or some of the coal-tar products, for the reduction of temperature in typhoid fever. This Society cannot do a greater act to humanity than to put its stamp of condemnation upon this form of practice. I am satisfied that I have seen cases treated early by these drugs whose hearts were so weakened by their continued use that they were unable to withstand even a moderate amount of disease, and quickly succumbed to heart-failure. This method of practice borders on the criminal, and physicians who have no other remedy at hand to give in typhoid fever should calmly allow nature to take its course and allow the patient to recover without their interference with these prostrating and deadly drugs.

I do not believe guaiacol is a specific for typhoid fever, but I do believe an intestinal antiseptic is demanded, and I know of none better than guaiacol.

The question of treatment might be summed up as follows: never allow the bowels to become constipated; never give opium; never give phenacetin or acetanilide; give plenty of water, both by mouth and rectum; keep the alimentary canal as aseptic as possible; give good, nourishing food. If these are followed, you will find that a death from typhoid fever will be the exception.

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*THE EFFECT OF PERMANGANATE OF POTASSIUM IN OPIUM-POISONING.**

By Leedom Sharp, LL.B., M.D.

THE difference of opinion held by the medical profession regarding the value of permanganate of potassium in opium-poisoning, together with a review of the cases reported, have led me to undertake a series of experiments, with the object of throwing some further light on the subject.

Clinical Data.—The observations of Dr. William Moor† brought prominently before the profession the question whether or not permanganate of potassium is an antidote in cases of opium-poisoning, by claiming that there are certain properties in the permanganate that are chemically antidotal.

He performed a series of experiments with the permanganate of potassium, morphine, and egg albumin, and from the results obtained concluded that one grain of the permanganate will destroy one grain of morphine, even in the presence of other organic matter. He therefore inferred that there was such an affinity between the two drugs that, if the permanganate is brought into contact with organic

* A thesis receiving honorable mention at the Commencement of the Graduating Class of '95 at the University of Pennsylvania.

† *New York Medical Record*, 1894, vol. i. pp. 200, 442, 642.

matter containing morphine, it will act on the morphine first.

He was, therefore, induced to resort to self-experimentation, believing that the oxidizing power* of the permanganate would decompose the morphine in the stomach, and thus render the poison inert. He consequently took three grains of morphine by the mouth, and followed it immediately by four grains of the permanganate, with no unpleasant results. The result of his work seems to have established in the minds of many the fact that permanganate is an antidote to opium if given by the stomach.

As morphine, when brought in direct contact with the permanganate, was found to be inert, the question arose as to how far, if at all, the permanganate would act if exhibited in a distant part of the body from that in which the poison was administered.

Schlagdenhauffen and Reeb, as a result of their experiments on frogs, claimed prior to Moor's studies,† when investigating with another drug, that if permanganate was injected separately it would modify the action.

Dr. Moor was of the opinion that the permanganate was of value, even after the poison had been absorbed, if given by the stomach. He based his opinion on the investigation of Professor Hitz, of Halle, who maintained that a part of the opium absorbed returns to and is eliminated in the stomach, where it would be acted upon by the permanganate.

If this be true, and it seems to have the corroboration of Marne,‡ Alt,§ Trauber,‖ and others, it suggests itself to me that traces of the morphine might be found in the fæces by the proper tests. This of itself would be of value in cases of suspected morphine habit, which iniquity the patients are so apt to deny.

Again, if the morphine is excreted by the cells of the stomach, it must be a continuous action, and therefore a frequent washing out of the stomach must of itself be an advisable treatment in opium-poisoning. This occasional washing out of the stomach may account for the improvement in some of the cases reported.

Dr. Moor and also some physicians in St. Louis about this time made some experiments on dogs and rabbits, and gave them, by the mouth, doses as large as ten grains of morphine, administering permanganate, in varying strengths of solution, as an antidote. The results were the complete recovery of the animals. This is not strange, when it is considered that in no instance was there a fatal dose exhibited.

Dr. Rector followed their steps¶ by conducting some experiments on dogs with morphine and permanganate, with the same happy results, in no case having given a fatal dose.

Dr. Andrews,** however, in a course of investigations, showed beyond a doubt that in all the test cases of Dr. Moor and the others (on dogs and rabbits with morphine) the dose given could not have been fatal in any case. This was later demonstrated to be the case by Professor Wood in his experiments.††

Mr. Harding followed these investigations with a paper,‡‡ in which he brings to bear chemical facts to prove that the behavior of permanganate when brought in contact with organic matter is such that it is unreasonable to believe that it could have any antidotal properties.

Thus the opinions stood before the reports of the practical use of the drug appeared. Since then there have been quite a number of cases described, from which the following are taken to illustrate the uses, effects, and results of the drug when administered as an antidote.

Cases.—Dr. H. D. Walker reports a case§§ of a woman, an habitué to the morphine habit, but reformed, who was accustomed but a few months previous to take thirty grains of morphine per diem. She took a dose of 45 grains, and was subjected to the approved routine treatment, and some hours after taking the poison showed improvement on the exhibition of 15 grains of the permanganate.

It is a question whether in this case, the patient being an old habitué to morphine, she would not have recovered under the old treatment. Certainly no extraordinary antidotal qualities can be claimed here, yet there seems to have been some beneficial effect following the administration of the permanganate.

Drs. Moreland and Grigg report a case‖‖ of a man who took 2½ ounces of laudanum, of unknown strength, at 7.30 P.M., and was treated by another physician until sent to the hospital at 10 P.M. His condition was as follows:

* See the effect of the oxidizing power of peroxide of hydrogen.

† *Journal de Pharmacie*, October, 1893.

‡ *Deutsche Med. Wochenschr.*, 1883, No. 4.

§ *Berl. Klin. Wochenschr.*, 1889, No. 25.

‖ *Arch. f. Exp. Path. u. Pharmakol.*, Bd. xxvii., S. 336.

¶ *New York Medical Record*, 1894, vol. i. p. 460.

** Ibid., vol. i. p. 316.

†† *University Magazine*, vol. vi. p. 747 (Philadelphia).

‡‡ *New York Medical Record*, vol. i. p. 459.

§§ *Medical News*, vol. i. p. 380 (Philadelphia).

‖‖ Ibid., vol. i. p. 491.

respirations four per minute; pulse weak; reflexes gone; pin-point pupils; bladder distended; profound coma.* The treatment he received was, besides that by the previous physician, artificial respiration, atropine, flagellation, and 12 drachms of a one-half saturated solution of permanganate (estimated) hypodermically. Recovery resulted in six hours and forty-five minutes.

This is one of the best of the reported cases, yet the previous treatment by another physician is wholly omitted. The number of respirations, the pulse, and the temperature are wholly ignored from the time of his admission until almost complete recovery.

The permanganate seems to have been followed by a marked improvement after its injection; but when we consider the vigorous treatment received in addition to the permanganate, it can scarcely be claimed that the drug evidenced any remarkable properties; the same improvement frequently results as conspicuously under the old treatment.

Two other cases are reported by them, which, owing to the lack of detail, are not germane to this paper.

Dr. Pyle reports a series of cases,† none of which seems in any way to prove the alleged antidotal properties of the permanganate.

In the *first case* routine treatment was given in addition to the permanganate. Here the drug surely had an opportunity to show its value, the patient being under treatment and alive for seven hours, yet death resulted.

The *second case* (where the dose was unknown, had the stomach washed out thirty minutes after taking the narcotic, atropine being administered at the same time) received, together with a solution of permanganate, the most vigorous and approved treatment; recovery of reflexes and consciousness followed in one hour and twelve minutes, and the patient was discharged the next day.

The recovery was so rapid, the treatment so vigorous, and the report so meagre, regarding pulse, respirations, temperature, and the effect following the administration of the permanganate, that it is impossible to determine whether the permanganate was of value or not.

The *third case* (the dose being ½ ounce of laudanum) was under treatment within one hour after receiving the drug. The treatment was the approved routine methods, together with a solution of permanganate per the stomach and hypodermically. Recovery in fifteen minutes.

The recovery was so extremely rapid, the fatal dose so small, the respirations never below eight per minute, the reflexes never lost, and the report so insufficient that there is no value to be attached to the case.

Regarding the *fourth case*, the dose being but 2 drachms of laudanum, the report was so unsatisfactory and the treatment so slight that it would have been quite as well not to have reported it.

Dr. J. C. Crossland's patient,‡ by whom 2 ounces of laudanum are supposed to have been ingested, was found in a comatose condition with symptoms of opium-poisoning. Treatment began at 8.30 P.M., about one hour after the dose was supposed to have been taken. There were given atropine, electricity, and permanganate by the stomach; the respirations and pulse improved and the pupils dilated. At 9.30 P.M. atropine was again administered; the respirations and pulse were slightly better and the pupils normal. At 10.30 (no permanganate having been given since 9.10) the condition became alarming, and nitro-glycerin, atropine, and electricity were given. At eleven o'clock the patient regained consciousness and gradually recovered.

In this case it is impossible to say with certainty whether or not the permanganate was of value.

The doctor mentions another case in which 4 grains of permanganate had no effect after the ingestion of an ounce of laudanum.

Dr. J. S. Carpenter reports a case§ of peculiar idiosyncrasy, where the patient exhibited symptoms of morphine-poisoning, following an injection of morphine and atropine, given in treatment. An hour and a quarter after the administration of the drug the doctor arrived, and immediately adopted the "established treatment," giving atropine freely in doses as high as $\frac{1}{48}$ grain; artificial respiration was employed continuously, and there were given 37 drops of a saturated solution of permanganate in three doses hypodermically (about 3 grains). Some improvement in respirations followed the second dose. Recovery in two hours and fifty-five minutes.

Dr. C. Evan Johnson's case,‖ where permanganate was given, together with the old treatment, simply states that "decided improvement" followed each injection, without

* Description supplemented in *University Magazine*, vol. vi. p. 107.

† *Medical News*, vol. i. p. 514 (Philadelphia).

‡ *Cincinnati Lancet-Clinic*, new series, vol. xxxii. p. 651.

§ *Medical News*, vol. i. p. 699.

‖ Ibid., vol. ii. p. 104.

showing what that improvement was, whether number or depth of respirations, pulse, reflexes, or pupils, and therefore can carry no weight as to the value of the drug. It is a fair sample of the disappointment experienced in reviewing many of these cases, and reliance in the physician's report must be shaken by the carelessness of the observations.

Dr. C. H. Callender's report of his case* is by far the most satisfactory reviewed.† It shows that following the first injection of the permanganate and the subsequent injections there was a decided improvement in respirations, increasing in number from 8 to 12, to 16 and 18, and in the pulse from 46 to 54, 68, and to normal. In this case 2 ounces of laudanum had been taken.

This is a unique case, as it reports no other treatment but that of walking the patient. In order to satisfy myself that no other treatment was given, I communicated with Dr. Callender on the subject; and I have received a reply assuring me that, owing to an accident to his carriage, in which his medicine-case was left, he had neither atropine, strychnine, nor caffeine, or he should have used them; and that the only other drug used in the case was the permanganate, and the only other treatment given was that of walking the patient, and prior to his arrival the rubbing of the patient with whiskey.

This, then, is the only case I have found where permanganate alone was relied upon in a case of opium-poisoning, and *is* of value as to the action of the drug.

Dr. J. I. Darby reports a case,‡ with considerable detail, of a man who took 12 grains of morphine about 12.30 A.M., he having a *few* times before taken ¼ grain of morphine for insomnia. At six o'clock, when the doctor arrived, he was aroused sufficiently to take a cupful of strong hot coffee and a 3-grain solution of permanganate, with no apparent effect. General and vigorous routine treatment followed, including atropine, electricity, and so forth. After 2 P.M. the condition being very grave, he was given a 2-grain solution of permanganate, which was followed by improvement in respiration. Gradual improvement followed, with recovery in nineteen hours.

This is an interesting case, and I regret that Dr. Darby did not use the permanganate more frequently and earlier in the treatment. It shows, however, that there was no evidence of improvement from the larger dose given by the stomach, while there was a decided and marked improvement following the hypodermic injection.

Dr. C. M. McGuire offers a case§ to the profession to show that permanganate is not only worthless but a dangerous drug to use. In this case, four hours after the ingestion of the poison and after the patient was well on towards recovery, he gave some 3 or 4 grains of permanganate to the patient. Sudden collapse followed; this he attributes to the permanganate. Shortly after this the patient recovered after persistent routine treatment.

This case acted similarly to the case of Dr. Crossland, in which the patient became suddenly worse an hour and a half after the administration of the permanganate; and can possibly be explained as one of the peculiar or erratic results of opium-poisoning, or by some peculiar idiosyncrasy on the part of the patient for the permanganate, or some condition not observed, as a dose of 4 grains of permanganate is but an ordinary therapeutic one, not infrequently given.

In this case it will be observed that there is no mention of the reflexes, and that the pulse and respirations received but a passing mention. The conditions immediately preceding and following the giving of the permanganate are not noted; consequently there is little value in the report.

The lack of detail and of careful observations recorded in most of the cases render them of little value in the study of permanganate.

After a careful review of the cases, one is loath to believe that the permanganate, save in the case of Dr. Callender,‖ saved the life of the patient, in view of the associated treatment.

Apropos to the above cases, the case of Dr. Percy Pope¶ is an instance of what may be and has been accomplished with persistent and intelligent routine treatment. Here a young girl of nineteen, who never before had taken opium, to her knowledge, took 12 grains of morphine hypodermically, and recovered in thirty-six hours under his constant and persistent treatment.

While this is an extreme case, it nevertheless goes to show from what enormous doses it

* *New York Medical Record*, vol. ii. p. 345.

† Here the question arises as to where the laudanum was obtained, as that kept by many country drug-stores is not very poisonous; at times inert.

‡ *Atlanta Medical and Surgical Journal*, vol. xxvi. p. 389.

§ *New York Medical Record*, vol. ii. p. 343.

‖ The question as to the quality of the laudanum, however, suggests that even here its effect may be overestimated.

¶ *London Lancet*, March 17, 1894.

is possible to rescue your patient by the old-style treatment.

With this case in mind, together with the other cases reviewed, it must be admitted that the question of the true antidotal properties of permanganate is far from being established.

This conclusion being reached, and with the hope of finding something definite concerning the action of the drug, I have undertaken a few experiments on animals.

In considering these experiments it must be borne in mind that the lower animals, relatively to man, are peculiarly insusceptible to the action of morphine, and that the minimum fatal dose for rabbits was found by Falck to be .72 gramme per kilogramme of weight. It must also be remembered that rabbits vary somewhat in their susceptibility to the drug; and further that there is a considerable variation in their respirations and pulse, and that the latter is so sensitive to outside influences, such as alarm, noise, touch, the presence of dogs, and so forth, that it is not wise, in these experiments, to here attribute the noted changes in the pulse-rate to the effect of the drug being experimented with. For this reason I have not taken observations of the pulse in the following experiments.

It is claimed by the friends of the permanganate theory that one grain of permanganate is sufficient to decompose one grain of the morphine.

Professor Wormley, in his experiments with the two drugs,* in which he dissolved two hundred and fifty milligrammes of morphine sulphate in twenty-five cubic centimetres of water containing five hundred milligrammes of the permanganate, found traces of morphine present. In my Experiment 12, in which I dissolved equal parts of the drug and mixed them together, and then filtered, there was found morphine present in both the filtrate and precipitate amounting to some six per cent.†

These experiments would, therefore, show that, even when brought together in the proportion of morphine one and permanganate two, all of the morphine is not destroyed.

Experimental Data.—In my control experiments numbered 1, 2, and 3, it will be seen that comparatively small amounts of the permanganate produced death in the rabbits, which would seem to be out of all proportion to the lethal dose of morphine. It is, therefore, impossible to make satisfactory experiments applicable to man, and it must follow that to save the rabbit from death from morphine-poisoning it must be killed with the permanganate, unless it could be saved by giving an amount of the permanganate only sufficient to neutralize enough of the morphine to reduce it to less than a fatal dose. This failed in experiments numbered 7, 8, and 10.

As the fatal dose of morphine in man is usually so small and the toxic effect of permanganate so insignificant, the same objection cannot be raised.

In the endeavor to ascertain if the dose of Falck was given by the stomach or hypodermically, I gave a rabbit .80 gramme per kilogramme of weight by the stomach, through a No. 11 rubber catheter, by which all exhibitions by the stomach were made, without it being visibly affected, except a certain drowsiness or stupor. I therefore thought that, if the stomach were washed out and morphine administered, I could produce death with Falck's dose of morphine. In this I was unsuccessful. I could not wash the stomach out, and the rabbit died in my experiment while endeavoring to do it. I consequently concluded that the dose was a hypodermic one, and so considered it, giving all the morphine hypodermically.

Has Permanganate any Antidotal Properties?—From the cases cited and from my experiments I think there is evidence to show that permanganate exerts an influence that combats to some extent the effect of morphine. While there is but one case reported that can be said to have recovered from the poisoning by the administration of the permanganate, there is scarcely one reported that could not have recovered under persistent and judicial treatment had the permanganate not been given; yet I am convinced that in a few of the cases there is evidence of a decided effect produced by the use of the drug. I am confirmed in this belief by the results of my experiments, which show not only that there was a marked increase in the number of respirations and an apparent effect on the circulation, but that in each case where morphine had been given the lives of the animals were materially prolonged beyond the time at which death occurred in the control experiments with morphine, when permanganate was exhibited to combat the poison.

Is this Action Chemical or Physiological?—There can be no doubt that morphine is rendered largely inert by permanganate, when the two are brought together in direct contact. The illustration given by Dr. Moor, together with the experiments of Professor Wood and my experiment numbered 12, leave no room to doubt that when permanganate is taken imme-

* See Professor Wood's paper (*ante*).

† See analysis in Appendix.

diately after the administration of a toxic dose of morphine, or when given together, the poisonous effects are destroyed.

To satisfy myself of this, I performed the following experiments, first having ascertained the toxic dose on rabbits in the control experiments numbered 4 and 5.*

I treated ten cubic centimetres of an eight-per-cent. solution† of morphine with five cubic centimetres of a two-and-a-half-per-cent. solution of the permanganate, getting a thick, brownish-gray mixture, in which were scattered dark-brown specks. This I filtered five minutes later, getting eleven cubic centimetres of a rich sherry-colored liquid tinged with green. The permanganate should have acted on a sufficient quantity, weight for weight, of the morphine, so as to reduce the amount unacted upon below Falck's minimum fatal dose.

Experiment 11.—Rabbit; weight, .86 kilos.

Time.	Mixture Subcutaneously.	Result.
10.07 A.M.	11 c.c.	12.34, death; opisthotonos in 2 hours 27 minutes.

As the death of this rabbit may be accounted for by its age, estimating it by its size, I made another test. I made a mixture of morphine and permanganate, weight for weight, and heated it at 80° C. for ten minutes. A thick, turbid, dark chocolate-colored substance resulted; this I filtered, and got a rich, sherry-colored fluid, similar in appearance to Lougal's solution.

Experiment 12.—Rabbit; weight, 1.50½ kilos.

Time.	Mixture Subcutaneously.	Result.
9.30–35	31 c.c.	Complete recovery.

I made an analysis of the filtrate and of the precipitate. Both analyses showed the morphine not to have been entirely destroyed.

This experiment indicates the chemical action of the drugs when brought together in direct contact, and also shows the morphine to have been rendered practically inert outside the body.‡

In order to test the value of the permanganate as a chemical antidote on the morphine claimed to be eliminated in the stomach, I performed the following experiment: §

Experiment 10.—Rabbit; weight, 1.72 kilos.

Time.	Morphine.	Permanganate.	Result.
4.37	18 c.c.	1-per-cent. hypodermic solution, 18 c.c.	Death in 57 minutes.
5.01	.....	Per stomach, 36 c.c.	
5.20	.....	5-per-cent. solution, per stomach, 18 c.c.	

Here it will be seen that the rabbit received weight for weight of morphine and permanganate. The injection of the permanganate, which was given in identically the same place as the morphine, was sufficient to act chemically on enough of the morphine to reduce the dose to the minimum fatal one.

Giving the morphine time (supposedly) to be eliminated by the cells of the stomach, I gave in twenty-four minutes by the stomach .36 gramme of permanganate, a sufficient amount to act on the morphine and reduce the dose much below a fatal one, did it act chemically; yet the rabbit failed so rapidly that I was obliged to try and revive it by another and much larger dose. The animal survived but fourteen minutes, and would have died earlier but for artificial respiration.

From this experiment it would seem that there was little or no effect produced by the first injection of the permanganate; that the dose of morphine was so great that no physiological effect was apparent from the first two doses of the permanganate; that if the morphine was returned to the stomach and was there acted upon by the permanganate, it must have been after it had produced the systemic toxic effect, and therefore incapable of doing further harm had the permanganate not been administered; or that it was not returned to the stomach at all; or if it was so returned, it remained unacted upon by the permanganate.

It will be noted that there was a marked increase in the number of respirations following the last and stronger dose of the permanganate.

From experiments numbered 7 and 8 it will be seen that there was enough permanganate given by the stomach in each case to have rendered sufficient of the morphine inert had it been acted on chemically, so as to have reduced the dose far below a fatal one, yet both rabbits died.

It would seem, therefore, that there is no evidence to show that after the morphine is

* See Appendix.

† Made by heating.

‡ See also Professor Wood's experiments on pigeons.

§ See Appendix.

absorbed the permanganate acts chemically upon it; but that if the permanganate proves of any antidotal value, it is due to its physiological properties, and is therefore a physiological antidote.

ganate as having saved the lives of patients, in the cases cited, I can but admit, after a study of them and the observations in my experiments, that the permanganate acts in what seems to be a physiological manner.

Epitome of Experiments on Rabbits.

Experiment.	Weight. Kilos.	Drug exhibited.	How exhibited.	Amount. Grammes.	Time of Death.	Respirations.
1	1.61¼	Permanganate.	By stomach.	2.95	2½ days +.	Rose from 30 to 250; fell to 50.
	.96¾	Permanganate.	Subcutaneously.	1.00	21 hours.	Rose from 54 to 120.
3	1.18¼	Permanganate.	Intravenously.	.17	50 minutes.	Rose from — to 145; fell to 78.
4	2.36¼	Morphine.	Hypodermically.	1.92	18 minutes.	Decreased from 90 to 78.
5	1.61¼	Morphine.	Hypodermically.	1.36	23 minutes.	Decreased from 48 to 30.
6	1.18¼	Morphine and permanganate.	Subcutaneously.	M. 1.08¼ / P. .57½	1 hour 52 minutes.	Rose from 51 to 105; fell to 42.
7	1.39¾	Morphine and permanganate.	By stomach.	M. 1.12 / P. 1.00	2 hours 17 minutes.	Rose from — to 200+; fell to 100.
8	1.18¼	Morphine and permanganate.	By stomach.	M. .946 / P. 1.50	2 hours 22 minutes.	Decreased to 32; rose to 105.
9	1.93½	Morphine and permanganate.	Intravenously.	M. 1.56 / P. .10	56 minutes.	Rose from 30 to 166; fell to 100.
10	1.72	Morphine and permanganate.	By stomach and subcutaneously.	1.44	57 minutes.	Decreased from 38 to 21; rose to 108.
11	.86	Morphine, 10 c c. / Permanganate, 5 c.c. / filtrate.	Subcutaneously.	11 c.c.	2 hours 27 minutes.	Decreased from 48 to 13; rose to 156.
12	1.50½	Morphine. / Permanganate. / filtrate.	Subcutaneously.	31 c.c.	Recovery.	Rose from — to 126; fell to normal.

These experiments will be found in detail in the Appendix.

Experiments with Peroxide of Hydrogen.

Experiment.	Weight Kilos.	Drug exhibited.	How exhibited.	Amount. C.c.	Time of Death.	Respirations.
13	1.18¼	Morphine. / Peroxide, ¼ strength.	Hypodermically.	12.0 / 37.0	44 minutes.	Decrease from 60 to 18; rose to 150.
14	1.39¾	Morphine (warm). / Peroxide, full strength.	Hypodermically. / Hypodermically. / By stomach.	14.0 / 35.0 / 18.0	11 minutes.	Decrease from 75 to 21 later (?).
15	.75¼	Morphine, 10 c.c. / Peroxide, 20 c.c.	Hypodermically.	25.0	6 minutes.	Impossible to get after injection (40 ?).
16	.64½	Morphine. / Peroxide, full strength.	Hypodermically.	6.5 / 10.0	3 minutes.	Impossible to get after injection (48 ?).
17	.96¾	Morphine. / Peroxide, ⅛ strength.	Hypodermically.	9.5 / 48.0	28 minutes.	Decrease from 81 to 33; rose to 87.

These experiments will be found in detail in the Appendix.

Is the Action, therefore, Physiological?—From a review of the cases and from the results of my experiments, I can but believe that it is in this manner that the permanganate may be of value.

Binz and Sydney Ringer claim, from self-experimentation with permanganate, to have experienced a marked action on the respirations.*

While placing little reliance in the perman-

The conclusions of Professor Wood,† drawn from his two experiments on rabbits, seem scarcely just, when you consider the difference in the susceptibility of rabbits and the difference in the weight of the animals. Both were given the same dose of morphine. The larger took less than the fatal dose of Falck, while the smaller one took more than a fatal dose, together with the permanganate. It therefore seems to me unfair to attribute the earlier death of the smaller rabbit to the permanganate.

* Dr. H. I. Jones's article, *Journal of the American Medical Association*, vol. ii. p. 630.

† *University Magazine*, vol. vi. p. 747 (*ante*).

My first experiments, as before mentioned, were to ascertain what method Falck used in administering his fatal dose, and concluded that it was hypodermically. My next experiments were for control; to ascertain the amounts of permanganate and of morphine that would kill. In the experiments with morphine for control and those following I gave in each case the morphine in the proportion of .80 gramme per kilogramme; it will, therefore, be necessary to bear this in mind.

From the foregoing epitome the following will be noted:

1. That the control experiments establish fatal doses for morphine and permanganate.

2. That when the permanganate was given after the exhibition of the fatal dose of morphine, the life of the rabbit was prolonged beyond the time at which death resulted from the morphine control experiments.

3. That the number of respirations was increased in each instance following the administration of the permanganate.

4. That the amount of the permanganate given by the stomach and subcutaneously after the dose of morphine was sufficient to destroy enough of the poison to reduce the amount exhibited far below a fatal one did it act chemically, yet each case proved fatal.

It is particularly interesting to note that shortly after the administration of the permanganate there was a marked rise in the number of respirations, showing it to influence in some manner physiologically, directly or indirectly, the respiratory mechanism; this may be by acting as a stimulant or by acting as an irritant; and, further, it will be seen, by reference to the cases in detail in the Appendix, that there is evidently some influence produced on the vaso-motor system by the marked dilatation of the vessels of the ears.

In the endeavor to ascertain if the administration of the permanganate has any effect on the blood-pressure, I performed Experiments 18 and 19 on dogs.* In Experiment 18 I gave the permanganate alone, while in Experiment 19 I gave the permanganate after the exhibition of morphine. In both instances there was a steady and perceptible fall in the pressure, save at the time of, or immediately following, the exhibition of the drug. This may be accounted for by the irritation caused by the permanganate.

In both experiments there was an early and persistent clotting which effectually prevented the taking of further tracings. In Experiment 18 the clotting commenced in thirty-six minutes; while in Experiment 19, where opium had been exhibited and a much less quantity of the permanganate, the clotting began in one hour and ten minutes.

In Experiment 18 the dog survived but two days, after repeated injections of digitalis; while the dog of Experiment 19 died of opium-poisoning in less than two hours after its exhibition.

It would, therefore, seem that whatever effect the drug has on the circulatory system, as evidenced by the dilatation of the vessels in the ears of the rabbits, it cannot be ascribed to pressure, but might be due to some effect on the vaso-dilators or to vaso-constrictor paresis.†

It would also appear from the early clotting in both experiments that permanganate or some of its products has some action which produces a change in the character of the blood, showing that some chemical action takes place which throws something into the circulation to produce it.

This effect on the blood may account for the physiological action produced, and in small and therapeutic doses may also account for its beneficial action in the cases of poison by the morphine.

The permanganate seems to act antagonistically to morphine when introduced hypodermically, as it does when given by the stomach. Schlagdenhauffen and Reeb, in their experiments, found that when the drug was so administered it had the effect of suspending the action of the poison they were investigating. The case of Moreland and Grigg would indicate a similar action. In Carpenter's case the respirations seem to have improved, though the respiration-rate is not given. Callender's case certainly is of much importance as illustrative of this point.

Darby's case also shows an improvement in the respirations after the hypodermic injection. My experiment numbered 6 shows that while the respirations at first seemed to be influenced by the morphine, they were markedly increased after the injection over the spine.

By reference to Experiment 10 it will be seen that little effect was produced by the first two exhibitions of permanganate in the smaller doses, after the morphine had been taken up by the system, although the first was introduced through the same needle and into the same pocket with the morphine; yet when the larger and more powerful dose was given, after the morphine had probably done its

* See Appendix for particulars.

† The vessels were found dilated, post mortem.

work, there was a great change in the number of respirations.

It is interesting to note that in Experiments 7 and 8, where the permanganate was introduced by the stomach, as compared with Experiment 6, where it was given hypodermically, the rabbits lived much longer when it was given by the mouth; notwithstanding that when it was exhibited hypodermically it was given as nearly as possible in the same place that the morphine was injected and as soon after as practicable. The amount of permanganate in each case was sufficient to reduce, chemically, the dose of the poison below the fatal limit, and being brought almost simultaneously into the same area as the morphine, the chance for its chemical action can hardly be questioned.

That these improvements in respiration and the effect produced by the permanganate can be attributed to its direct action on the morphine I think there is great reason to doubt. While it may not be the permanganate that is taken up by the system, it may be some of the products of the drug.*

Is Permanganate a Reliable Antidote?—From the self-experimentation of Dr. Moor, the experiments of Professor Wood, and my experiment numbered 12, it would seem that the permanganate, when given with or immediately after the administration of the morphine, either by the stomach or as a filtrate hypodermically, acts as a reliable antidote.

The improvement following the exhibition of the permanganate in several of the cases quoted, and the effect on the respiration I was able to observe in my experiments, warrant me in believing it to be a valuable adjunct to the old treatment, but not reliable *per se*.

The enormous doses of the morphine necessary to destroy the lower animals render satisfactory experiments impossible, as the animals cannot survive both drugs; and as I do not think that there is sufficient evidence to be found in the cases to warrant the placing of any reliance on the permanganate solely as an antidote, I think its alleged properties are far from being established.

After a careful review and study of the cases, it is with great difficulty and hesitation that one can arrive at any definite or satisfactory conclusions. The large majority of the cases are found worthless, owing to the careless way in which they are reported or a lack of care in the observations made during the treatment of the case.†

Again, when it is found that the administration of the drug is always associated with the most vigorous and approved methods of treatment, together with the exhibition of drugs that are known to produce the general improvement usually noted after the use of the permanganate, it is with a feeling of greatest timidity and uncertainty that one attempts to draw conclusions. It can, however, be safely inferred that in no case, except, perhaps, that of Callender's, was the life of the patient saved by the use of the permanganate alone, and in no case was it principally relied on.

No direct influence of the permanganate, when given hypodermically or by the stomach, on the morphine absorbed into the system has been demonstrated or proved to exist. This has, however, been claimed, and it is said to be due to the ability of the permanganate to give up a portion of its oxygen in the presence of organic matter. That this is true I am inclined to believe, because a person poisoned by opium dies as much from asphyxia resulting from CO_2 poison as he does from the opium, and it appears but reasonable to suppose that any additional oxygen put into circulation must act antidotally to the CO_2 poison, and thus prolong or save life.

That this is probable is evidenced by the case of Dr. W. C. Merry.‡ Here a man recovered who had taken 2 ounces of chlorodyne and was found in a completely cyanosed

* See editorial on permanganate, *Journal of the American Medical Association*, vol. i. p. 755.

† As an instance of how little evidence there is to show that permanganate exerts a beneficial effect, there is reported a case interesting as a literary and narrative effort, though of little value medically. The doctor was called, and arrived three-quarters of an hour after the patient had taken the contents of a vial of L. and L., afterwards estimated to contain some three drachms of laudanum, of unknown strength. During one hour and three-quarters this case received from the doctor, as treatment, according to his report, 1/6 grain of apomorphine. The temperature during this time was never taken, the reflexes never lost (note the effect of the hypodermic needle), the pupils contracted (did they respond to light?), the respirations slow, etc. After the lapse of the one hour and three-quarters spent with his patient, he used permanganate of potassium, with happy, and to him remarkable, results. This case is of interest in one way, —*i.e.*, There was practically no other drug or mechanical treatment instituted; hence, provided the original amount of the drug, or that which was absorbed before the apomorphine exerted its effect, was lethal, recovery would necessarily depend upon the effect of permanganate. Such reports of cases, with their lack of detail and careful preparation, are of little value to the profession and do little towards gaining its confidence. Neither do they add "testimony to evidence." A case of mine will be found in the coming number of the GAZETTE which is of *as little* value. The similarity of the two will please be noted. (September 15, 1895.)

‡ *Lancet*, vol. i. p. 1372 (London).

Experiments on Rabbits.

Experiment 1.—Rabbit; weight, 1.16¼ kilos. (Control experiment, by stomach.)

Time.	Date.	5-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
A.M.					
12.00	Dec. 26	...	35		Death in 2½ days.
P.M.					Veins beneath skin injected and dark; heart stopped in diastole; thick black clot in each cavity; lungs congested and reddened; liver dark black or purple, where it was in contact with the stomach; gall-bladder filled with black fluid; stomach filled with food of a light brownish-gray color, walls much inflamed, thickened, and blackened, especially the rugæ; duodenum empty; kidney seemed dark and congested.
12.35	Dec. 26	6			
12.40	Dec. 26	...	50	Vessels in ears markedly dilated.	
12.53	Dec. 26	6	54	Vessels in ears markedly dilated.	
1.15	Dec. 26	6	60	Vessels in ears markedly dilated.	
1.30	Dec. 26	6	...	Not visibly affected.	
2.30	Dec. 26	...	...	Rabbit nibbles cabbage.	
A.M.					
9.45	Dec. 27	17	...	Had urinated; test shows no albumin, high colored and odorous.	
9.47	Dec. 27	...	138		
9.50	Dec. 27	...	200	Ears again show dilated vessels.	
10.00	Dec. 27	...	...	Rabbit looks sick and languid.	
10.10	Dec. 27	...	250 +	Sprawls full length; legs extended.	
10.25	Dec. 27	...	...	Regains sitting posture.	
10.35	Dec. 27	...	51	Respiration irregular.	
11.15	Dec. 27	18	141	Respiration immediately rose after injection; grits teeth; quiet and sick.	
A.M.					
9.30	Dec. 29	...	...	Found rabbit dead.	

Experiment 2.—Rabbit; weight, .96¾ kilo. (Control experiment, subcutaneously.)

Time.	Date.	2½-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Per abdomen.			
4.05	Jan. 3	5	54	Rabbit tied down.	Death in 21 hours.
4.10	Jan. 3	...	80		Permanganate injected had infiltrated through abdomen walls, discolored the liver and intestines and apparently the lungs; great discoloration around points of injection; heart stopped in diastole; clot filled right auricle and ventricle; small clot found in mitral valve; lungs, liver, and kidney apparently congested.
4.15	Jan. 3	...	96	Vessels in ears greatly dilated.	
4.20	Jan. 3	5	...		
4.25	Jan. 3	...	96		
4.30	Jan. 3	...	69		
4.35	Jan. 3	5	...		
4.45	Jan. 3	...	63		
4.50	Jan. 3	5	...		
		In back.			
4.55	Jan. 3	...	...	Released; hops around all right.	
5.10	Jan. 3	5	110		
5.25	Jan. 3	5	...		
5.35	Jan. 3	...	120	Dilatation in ears disappeared.	
5.40	Jan. 3	5	...	Nibbles cabbage.	
5.55	Jan. 3	...	105		
6.00	Jan. 3	5	96	Seems scarcely affected.	
A.M.					
9.00	Jan. 4	...	40	Found rabbit sick and drowsy; in a crouched position; creeps around with difficulty; seems strong enough; has defecated and urinated; is listless.	
P.M.					
12.45	Jan. 4	...	69	Weak and lying on side.	
12.50	Jan. 4	...	27	Respirations labored and shallow.	
12.55	Jan. 4	...	18	Sinking rapidly.	
12.58	Jan. 4	...	13	Respirations very shallow.	
1.01	Jan. 4	...	15	Scarcely perceptible.	
1.05	Jan. 4	...	...	Died very quietly.	

Experiment 3.—Rabbit; weight, 1.18¼ kilos. (Control experiment, intravenously.)*

Time.	1-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
P.M.				
12.45	2	60	Rabbit defecated.	Death in 50 minutes.
12 50	2	126	Heart appeared slowed and irregular; defecated.	Lungs collapsed; right side of heart markedly distended, both auricles much darker than ventricles; the right one markedly so; right ventricle much darker than left; all cavities filled with dark clot; superficial vessels of heart clearly defined and dark; veins in abdominal cavity and thorax clearly defined and prominent.
12.52	...	150	Heart action increased.	
1.04	3½	...		
1.07	2½	142	Respirations irregular; defecated.	
1.10	...	140	Respirations irregular; fast and slow at times; heart slower.	
1.20	5	...		
1.25	...	78–80	Respirations strong and deep; struggles; heart appears slow, full, and strong.	
1.30	2	...		
1 35	...	...	Rabbit died; heart failed; a few spasmodic respirations after heart stopped.	

* Previous to giving injection, I mixed the solution of permanganate with some blood, drawn from the animal, to assure myself that it would not coagulate it.

Experiment 4.—Rabbit; weight, 2.36½ kilos. (Control experiment, subcutaneously.)

Time.	4-Per-Cent. Solution of Morphine. c.c.	Respirations.	Condition.	Post-mortem.
P.M.				
12.15–38	48			Death in 18 minutes.
12.45	...	84–90	Rabbit crawls around with great difficulty, as if partially paralyzed; very sensitive to noise and motion; pupils partially contracted, not markedly so.	
12.55	...	78–80		
12.56	...	.....	Rabbit died in marked opisthotonos; relaxed after death.	

Experiment 5.—Rabbit; weight, 1.61¼ kilos. (Control experiment, subcutaneously.)

Time.	8-Per-Cent. Solution of Morphine. c.c.	Respirations.	Condition.	Post-mortem.
P.M.				
2.55	17	48		Death in 23 minutes.
3.00	...	30	Rabbit dazed; moves with difficulty.	
3.18	...	...	Died in marked opisthotonos; relaxed after death.	

Experiment 6.—Rabbit; weight, 1.18¼ kilos.

Time.	4-Per-Cent. Solution of Morphine. c.c.	2-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Hypodermically.			
2.45	21.06	...	51–55		Death in 1 hour 52 minutes.
2.50	...	18	...		Anus when permanganate was injected moist and blackened; color passed through abdominal walls and discolored intestines and kidney.
3.07	...	...	22	Rabbit sitting up; dazed; drowsy.	
3.20	6	...	...	Gave extra morphine to correct error.	
3.30	...	...	27	Sits up; drowsy; sluggish.	
3.40	...	...	42	Vessels in ears dilated.	
3.50	...	...	42		
		Over spine.			
3.55	...	5	...	Rabbit very groggy.	All liquids from injections seemed largely absorbed.
4.05	...	...	105	Lies flat on belly; hind quarters are paralyzed.	
4.20	...	...	51	Resting in sitting posture.	
4.30	...	...	42		
4.35	...	...	...	Tetanic spasms.	
4.37	...	...	...	Died in opisthotonos; relaxed after death.	

Experiment 7.—Rabbit; weight, 1.39¾ kilos.

Time.	4-Per-Cent. Solution of Morphine. c.c.	2½-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
A.M.		Per stomach.			
11.40	28	...	48	Has fasted two days to partially empty stomach.	Death in 2 hours 17 minutes. Lungs congested, dark, and mottled; clot found in ventricle (chicken fat and currant jelly); other cavities empty, stopped in systole; stomach thickened and reddened about rugæ, especially about great curvature; partially filled with light grayish, odorless material; kidneys darkened and congested. (There was no appearance of permanganate in subcutaneous tissue from an injection given several days before. The chicken-fat clot may have resulted from the former experiments.)
11.50	...	40	...		
11.55	...	...	190		
P.M.					
12.05	...	...	160	Lying flat on belly; vessels in ears dilated.	
12.15	...	...	200 +	Sensitive to noise and motion.	
12.35	...	...	162		
1.10	...	...	100	Tetanic spasm; Cheyne-Stokes respirations.	
1.30	...	...	165	Spasmodic twitching.	
1.57	...	...	...	Died in opisthotonos.	

Experiment 8.—Rabbit; weight, 1.18¼ kilos.

Time.	4-Per-Cent. Solution of Morphine. c.c.	5-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Per Stomach.			
1.03	23.65	...	...	Been fasting two days to partially empty stomach.	Death in 2 hours 22 minutes. No clots found in heart; a small amount of blood found in all the cavities, except left ventricle, which was empty; stomach much more inflamed than in No. 7 and covering two-thirds of the surface; rugæ very prominent; contents about same as in No. 7; kidneys somewhat darker than normal.
1.05	.....	...	36		
1.07	.....	30	...		
1.14	.....	...	32		
1.30	.....	...	66	Vessels in ear somewhat dilated.	
2.00	.....	...	96	Lying flat on belly.	
2.30	.....	...	90	Slight spasmodic tremors.	
2.45	.....	...	60	Several spasmodic tremors.	
3.10	.....	...	105	Respirations very shallow; had severe tetanic spasm.	
3.25	.....	...	...	Rabbit died, after repeated severe tetanic spasms following in quick succession, in opisthotonos.	

Experiment 9.—Rabbit; weight, 1.93½ kilos.

Time.	½-Per-Cent. Solution of Morphine. c.c.	1-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
A.M.		Intravenously.			
11.30	19.5	...	...	Tied down.	Death in 56 minutes. Heart stopped in diastole; no clots found in it.
11.35	.....	2.5	...		
11.37	.....	2.0	27–30		
11.40	.....	2.0	...		
11.43	.....	...	30		
11.50	.....	...	33		
11.54	.....	3.5	...	Released.	
12.00	.....	...	54	Drowsy; lying flat on belly; very sensitive to noise and motion; convulsive twitches, followed by tremors.	
P.M.					
12.05	.....	...	69	Tremors ceased.	
12.06	.....	...	...	Another convulsion, followed by quiet.	
12.07	.....	...	96		
12.09	.....	...	...	Tetanic spasm, followed by complete prostration.	
12.11	.....	...	166		
12.13	.....	...	...	Another spasm.	
12.17	.....	...	166	Severe spasm.	
12.20	.....	...	166		
12.24	.....	...	116	Continuous spasms.	
12.25	.....	...	100		
12.26	.....	...	...	Died, after repeated spasms, in opisthotonos.	

Experiment 10.—Rabbit; weight, 1.72 kilos.

Time.	8-Per-Cent. Solution of Morphine. c.c.	1-Per-Cent. Solution of Permanganate. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Cutaneously.			
4.37	18	...	...	Tied down.	Death in 57 minutes.
4.40	...	18	...	About the same place as morphine.	
4.43	...	...	28		
4.50	...	...	27		
4.55	...	..	30	Respirations somewhat shallow.	
		Per stomach.			
5.00	...	36	...	Followed by opisthotonos.	
5.01	...	...	30	Released rabbit; assumes normal posture, lying as if frightened.	
5.10	...	...	30	Ears show vessels well dilated; pupils contracted, but respond; corneal reflexes present.	
5.15	...	... 5-per-cent. solution. Per stomach.	21	Respirations very shallow; tetanic spasms.	
5.20	...	18	...		
5.23	...	...	...	Two opisthotonos spasms in quick succession; saved by artificial respiration; prostrated.	
			Artificial.		
5.25	...	...	75		
5.27	...	...	...	Spasms; prostrated.	
5.30	...	...	75	Regains position on belly; tremors.	
5.32	...	...	108	Lies sprawled, with legs extended.	
5.34	...	...	...	Died suddenly in opisthotonos, relaxed on death.	

Experiment 11.—Rabbit; weight, .86 kilo.

Time.	Mixture of Morphine and Permanganate. Morphine, 10 c.c. of 8-Per-Cent. Solution; Permanganate, 5 c.c. of 2½-Per-Cent. Solution. c.c.	Respirations.	Condition.	Post-mortem.
A.M.				
10.07	11			Death in 2 hours 27 minutes.
10.10	...	48	Rabbit lively; hops around; sits normally.	Heart arrested in diastole; lungs collapsed; clot found only in right ventricle, largely filling it.
10.20	...	30	Quiet; seems unaffected.	
10.25	...	13	Respirations full and deep.	
10.40	...	18	Respirations full and deep.	
10.50	...	20	Respirations full and deep.	
11.00	...	24	Respirations full and deep.	
11.10	...	42	Seems about normal.	
11.20	...	45		
11.30	...	72	Eyelids and ears twitching.	
11.40	...	66	Choreic movements continue; lies with hind legs extended.	
11.50	...	78	Tetanic spasms; head drawn tightly back; severe tremors.	
12.00	...	96	Occasional opisthotonos; spasms continue.	
P.M.				
12.10	...	142	Emprosthotonos; great tremors, lasting 2¼ minutes; lies on side; struggles to regain normal posture.	
12.20	...	...	Similar condition continues.	
12.25	...	150	Similar condition continues, with occasional emprosthotonos.	
12.34	...	...	Died in spasm.	

Experiment 12.—Rabbit; weight, 1.50½ kilos.

Time.	Mixture of Morphine and Permanganate, Weight for Weight. c.c.	Respirations.	Condition.	Recovery.
A.M.				
9.25–35	31			Seemed but little affected; ate normally at 4.30 P.M. whatever was given to him; was sleepy and drowsy for a time; gritted his teeth occasionally about 2.30; borborygmus was heard for several hours.
9.40	...	75	Respirations irregular.	
9.50	...	100	Respirations fluttering at times.	
10 00	...	126	Respirations fluttering at times.	
10.15	...	60	Respirations fluttering at times.	
10.30	...	51	Posture natural; nervous and fidgety.	
11.30	...	45	Seems normal.	
12.30	...	48	Seems normal; borborygmus.	

Experiments with Peroxide of Hydrogen.

Experiment 13.—Rabbit; weight, 1.18¼ kilos.

Time.	Morphine. c.c.	Peroxide, ¼ Strength. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Hypodermically.			
3.17	12	...	60		Death in 44 minutes.
3.22	...	25	...		Subcutaneous tissue around area of injection filled with gas; crepitant to the touch; very moist.
3.25	...	...	18	Respirations full and deep; lack of muscular control in hind quarters; lies on belly flat.	
3.30	...	...	42	Respirations shallow; sensitive to noise; crawls around slowly.	
3.40	...	...	72	Respirations shallow; normal posture; flat on belly.	
		Over spine.			
3.50	...	...	126	Respirations shallow, irregular, fluttering; posture normal.	
3.55	...	12			
4.00	...	...	150	Respirations more regular and deep.	
4.01	...	...	...	Dies suddenly in opisthotonos; relaxes on death.	

Experiment 14.—Rabbit; weight, 1.39¾ kilos.

Time.	Morphine, Warm. c.c.	Peroxide, Full Strength. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Per stomach.			
3.10	14	...	75	Rabbit tied down.	Death in 11 minutes.
3.14	...	35			Stomach fully distended, and part of small intestines, with gas; stomach filled with brownish-gray material, which was odorless; blood-vessels of stomach and intestine prominent and bright red; area where hypodermic injection was made of peroxide white and crepitant; fluid mostly absorbed.
3.15	...	...	27	Rabbit released; lies flat on belly; muscular rigidity; ears show vessel dilatation.	
		Subcutaneously in back.			
3.20	...	18	...	Belly distended.	
3.21	...	...	...	Rabbit fell over on side; died in position of opisthotonos, relaxing after death.	

Experiment 15.—Rabbit; weight, .75¼ kilo.

Time.	Filtrate of Peroxide, 20 c.c., and Morphine, 10 c.c. c.c.	Respirations.	Condition.	Post-mortem.
A.M.				
10.20	...	40–52	Rabbit tied down.	Death in 6 minutes.
	Hypodermically.			
10.25	25	.....		
10.31	...	.....	Released; died in continuous spasmodic movements; opisthotonos *absent*.	

Experiment 16.—Rabbit; weight, .645 kilo.

Time.	Morphine. c.c.	Peroxide, Full Strength. c.c.	Respirations.	Condition.	Post-mortem.
A.M.		Hypodermically.			
10.45	...	...	48	Rabbit tied down.	Death in 3 minutes.
10.50	6.5	...	...		(NOTE.—In giving peroxide it came through the skin at other points than where the injection was made, while injection was being given.)
10.52	...	10	...	Rabbit released.	
10.53	...	10	...	Died immediately, after a few gasps.	

Experiment 17.—Rabbit; weight, .96¾ kilo.

Time.	Morphine. 8-Per-Cent. Solution. c.c.	Peroxide, ⅛ Strength. c.c.	Respirations.	Condition.	Post-mortem.
P.M.		Per stomach.			
3.55	...	25	81		Death in 28 minutes.
4.02	...	...	123	Rabbit seems very alert.	
5.10	...	...	63		
5.15	9.5	...	...		
5.18	...	...	33		
		Per stomach.			
5.20	...	25	...		
5.22	...	...	42	Lies stretched out on belly; hind legs extended; partial loss of power.	
		Over spine. ½ strength.			
5.26	...	10	...		
5.27	...	...	63	Breathing seems normal; same position.	
5.32	...	...	74	Slightly shallower breathing.	
		¾ strength.			
5.40	...	18	...		
5.41	...	...	87	Seems much improved; regained normal posture; more control over hind quarters.	
5.43	...	...	...	Died suddenly in spasm.	

and collapsed condition, who failed to respond to the routine treatment of morphine-poisoning, and was given inhalations of pure oxygen for twenty minutes every half-hour.

In this case the oxygen acted as a forced artificial respiration and an antagonist to the CO_2-poisoning, and as such seems to have been efficacious, and must have shortened the time of treatment, if not actually saved the patient's life.

That free oxygen in the system exerts any direct influence adverse to the opium, when absorbed, I think, may be doubted from the following experiments made on rabbits with the peroxide of hydrogen; these investigations were suggested to me in the course of my work.

These experiments were certainly unsatisfactory; the peroxide was given of various strengths and in different manners; yet in no instance can the life be said to have been prolonged, except, perhaps, in Experiment 13. This may have been due to the idiosyncrasy of the rabbit for the poison. There is no doubt that death was hastened in Experiments 14, 15, and 16; the last two, it would seem from the suddenness of their death, died from shock, while Experiment 17 may be said to be negative.

Post-mortem examination showed quantities of free gas infiltrating the subcutaneous tissue where the peroxide was given hypodermically, and showed the stomach and intestines distended with gas where it was exhibited by the mouth.

It is interesting to note in Experiment 15 that in bringing the two drugs—morphine and peroxide—together their active properties were *not* destroyed.

It might be added that, after the failure to get the desired effect by introducing the morphine by the stomach, and the ill success experienced in washing out the stomach for the purpose of getting that effect, it suggested itself to me to try an experiment by the rectum, by introducing the morphine and following it by a solution of permanganate.

This, however, was abandoned when it was known how much liquid it would require.* It

* A rabbit of .86 kilogramme (two pounds) would require more than fifteen cubic centimetres of an eight-per-cent. solution of morphine, if it took but twice a hypodermic dose.

seemed that it would be impossible to keep the solution in the bowel, especially when followed by the addition of the permanganate.

This but illustrates the disadvantage one labors under in experimenting with this drug on the lower animals.

Pathological Conditions.—Preparations of sections of the kidneys, liver, lungs, and stomach of the rabbits of Experiments 1, 3, and 10 show the effect produced in those organs by the circulation and elimination of the permanganate or its products. The condition found (the animals being presumably normal prior to the experiments) tends strongly to show that conditions of congestion in all of the organs follow the use of the drug in large and concentrated doses (as those found necessary to counteract the lethal dose of morphine), and that instead of remaining inert after its exhibition, as commonly supposed, it produces a systemic effect of no little moment.

In all of the specimens there were found areas of congestion and irritation, and in several the vessels were found filled with blood.

These changes certainly indicate that permanganate, when administered by the mouth or otherwise, gets into the circulation in some form (either as permanganate or one of its products) and works some change in the character of the blood.

Conclusions.

The conclusions to be drawn from the foregoing investigations are:

1. That the susceptibility of lower animals to the action of morphine renders experiments on them very unsatisfactory in arriving at any results referable to man.

2. That the dose of permanganate of potassium necessary to counteract the enormous lethal dose of morphine in the lower animals must of itself prove fatal.

3. That the exhibition of permanganate of potassium, by the stomach or hypodermically, has a marked influence in prolonging the life of rabbits poisoned by morphine.

4. That the action of permanganate of potassium, when given separately from and not immediately following the dose of morphine, is not chemical.

(*a*) Because there is no proof of a chemical action to be adduced from the cases or experiments.

(*b*) Because there is evidence that it does not act chemically.

5. That the action of permanganate of potassium is physiological.

(*a*) Because there is no proof that it acts chemically, except when brought in direct contact with the stomach.

(*b*) Because there is evidence that the exhibition of permanganate of potassium, by the stomach or hypodermically, increases the number of respirations.

(*c*) Because there is evidence that the exhibition of permanganate of potassium, by the stomach or hypodermically, has an appreciable effect on the circulatory system, as seen by the dilatation of the vessels of the ears and by the direct effect on the blood.

6. That permanganate of potassium is not a reliable antidote.

(*a*) Because there is no proof that when permanganate of potassium is given after the absorption of the morphine it is *per se* a reliable antidote.

(*b*) Because there is evidence that when the permanganate of potassium is given after the absorption of the morphine it is an unreliable antidote.

(*c*) Because there is proof that when permanganate of potassium is given after the absorption of the morphine it has no apparent effect.

7. That permanganate of potassium, like strychnine, caffeine, and atropine, has some valuable properties, useful in the treatment of morphine-poisoning, but as yet undetermined.*

Appendix.

Analysis of a Mixture of Permanganate of Potassium and Morphine.—The Filtrate.—Fourteen cubic centimetres of the filtrate (seventy-six cubic centimetres in all) of a mixture consisting of forty cubic centimetres of an eight-per-cent. solution of morphine sulphate and fifty-five cubic centimetres of a saturated solution of permanganate of potassium was treated with twenty-five cubic centimetres of ammonium hydroxide to precipitate any morphine present.

Then sixty-five cubic centimetres of hot amylic alcohol was added and well shaken up, so that it was thoroughly mixed; the ammonium mixture remaining at the bottom lost four cubic centimetres in bulk.

By means of a pipette the amylic alcohol was drawn off, and the ammonium mixture again washed with more hot amylic alcohol, which was drawn off as before.

The whole of the amylic alcohol thus drawn off was evaporated on a water-bath to dryness.

* The words "proof" and "evidence," as above used, are not intended to be synonymous, the former being positive, the latter relative.

The residue gave the morphine reaction with sulpho-molybdic acid.*

The residue, being of a dark color, was dissolved with water to which a drop or two of acetic acid was added; the solution was again treated with amylic alcohol, drawn off, and evaporated on the water-bath; the residue was of the same color as the original morphine solution, and gave a decided reaction for morphine.

The residue was then weighed and found to be .027 gramme, being the amount of pure morphine in fourteen cubic centimetres of the filtrate.

The Precipitate.—Dissolving the precipitate, together with the macerated filter-paper on which it was collected, in water, it was treated with ammonium hydroxide to eliminate the morphine present; this was then mixed with hot amylic alcohol to extract the morphine, and this process repeated, as with the filtrate.

The amylic alcohol was then evaporated on a water-bath to dryness; then dissolved in acetic acid and water and again treated with amylic alcohol, and evaporated to dryness, as before. This resulted in a light-colored residue similar to the residue from the filtrate, and gave a decided reaction for morphine.

The residue was again dissolved and treated with ammonium hydroxide, which threw down a flocculent precipitate, which was collected on equipoised filter-paper and was found to weigh .047 gramme; this precipitate responded strongly to the morphine test, while the filtrate did not, when brought in contact with the sulpho-molybdic acid.

Conclusions.—From the above analyses it would seem:

1. That from the morphine of the original mixture there could have been recovered from the whole filtrate .1465 gramme, figuring it from the amount recovered from the fourteen cubic centimetres; that, together with the .047 gramme recovered from the precipitate, the total amount of the forty cubic centimetres of morphine undecomposed was .1935 gramme.

2. That in the thirty one cubic centimetres of the filtrate given the rabbit in Experiment 12 there must have been .0598 gramme of pure morphine.

3. That the permanganate of potassium decomposed or destroyed only about ninety-four per cent. of the morphine.

(NOTE.—From recent experiments with *laudanum* I am inclined to believe that permanganate has not the same "chemical antidotal" properties on the morphine contained in the laudanum, and that much more morphine can be recovered after treating laudanum with permanganate. As my experiments so far are too few and not yet complete, I simply give this as a suggestion. If this be so, the effect of the administration of the permanganate in cases of laudanum-poisoning would indicate that its influence is rather physiological than chemical. —July 1, 1895.)

* The sulpho-molybdic acid is prepared by dissolving by gently heating three parts of molybdic acid in one hundred parts of sulphuric acid.

PRESSURE EXPERIMENTS.

Experiment 18.—Dog; weight, 9.46 kilos.

A.M.

11.00 Dog was etherized and canula introduced into left carotid artery.

11.18 Tracing taken when coming out of ether shows a pressure of 128 millimetres.

11.20 18 cubic centimetres of a two-per-cent. solution of permanganate was introduced hypodermically into abdominal muscles.

11.21 Tracing shows a slight rise of pressure of 4 millimetres. Pressure, 132 millimetres.

11.28 Tracing shows a fall of 20 millimetres. Pressure, 112 millimetres.

11.40 Gave 12 cubic centimetres of a two-per-cent. solution of permanganate into thigh muscles. Pressure, 102 millimetres.

11.42 Tracing shows a slight rise of pressure of 7 millimetres. Pressure, 109 millimetres.

11.51 Tracing shows a fall of 5 millimetres. Pressure, 104.

11.57 Obliged to discontinue tracing on account of *continuous clotting*, although several unsuccessful attempts were made to clear canula.

(NOTE.—Dog died two days later, having refused to eat, but drank frequently of water.)

Experiment 19.—Dog; weight, 7.74 kilos.

P.M.

1.40 Dog was etherized to introduce canula into lef carotid. Pressure, 110 millimetres.

2.05 Gave 40 cubic centimetres of an eight-per-cent. solution of morphine, which was followed by an immediate lowering of the pressure. Tracing shows a pressure of 78 millimetres.

2.15 Gave 40 cubic centimetres of a one-per-cent. solution of permanganate by stomach, with no apparent effect on pressure.

2.17 Tracing shows a pressure of 54 millimetres.

2.32 Gave 20 cubic centimetres of a two-per-cent. solution of permanganate hypodermically.

2.37 Tracing shows a pressure of 48 millimetres.

2.56 Pressure falling so rapidly, gave by stomach 50 cubic centimetres of a two-per-cent. solution of permanganate. Tracing shows a pressure of 42 millimetres.

2.59 Tracing shows a further fall. Pressure, 41.

3.15 Obliged to stop tracing on account of *clotting*.

(NOTE —Dog died shortly after release, at 3.20 P.M. from effect of the morphine.)

THE NUCLEIN TREATMENT OF TUBERCULOSIS.

By A. J. Rosenberry, M.D., Wausau, Wis.

THE recent interest in the treatment of tuberculosis seems destined to make up in force and volume for the static condition by which it was characterized for so many centuries.

All ranks of the profession seem to be pervaded by the absorbing question. To the casual student it will be apparent that professional opinion is at last crystallizing, and that the therapeutics of the future will consist in conferring immunity of a more or less absolute character.

The rational treatment of microbic diseases must be conducted in one of two totally different methods,—viz., 1, destruction of the specific cause *in situ;* 2, conferrence of a more or less complete immunity.

With the first method physicians, as such, can have nothing to do. The treatment is essentially surgical. With the far larger number of cases in which the disease is either disseminated or is localized in an inaccessible part, the treatment must be medical, and whether it be pharmaceutical, hygienic, or climatic, it aims to limit the disease by increasing the resistant power of the cell.

With a cell acting up to its highest possible efficiency, the multiplication and growth of pathogenic germs becomes impossible. There can be no doubt but that the treatment of the future will consist in bringing the vital activity of the cell up to a normal standard. The Koch treatment attempted to destroy the bacillus *in situ* by the introduction into the system of a toxic agent, which destroyed the patient first and the bacillus afterwards.

With the high resistant powers of the tubercle-bacillus to germicides, it is inconceivable that any agent will ever be discovered which will destroy it in the body without injury to the normal tissues. If the theory of phagocytosis of Metchnikoff be true, that there is a constant struggle between the white blood-cells and the various pathogenic germs which invade our bodies, it emphasizes the statement that the great object to be obtained by the therapeutist is to confer immunity, to furnish all the cells of the body with abundant supply of appropriate pabulum, and to increase the number of white cells. That we have in nuclein a substance which furnishes this cell food in a form in which it can be readily utilized seems quite certain. That it increases the number of white blood cells enormously has been demonstrated by the work of Vaughan, McClintock, and Warthin.

Having had experimental knowledge of the action of nuclein in my own case, I wish to record it, in the hope that others with larger opportunities for testing its merits may be induced to give it a trial, for, living, as I do, in a belt that is practically non-tubercular, opportunities for testing it are not frequent.

On February 28, 1894, I passed a large quantity of blood and some pus with my urine. Upon boiling the urine, three-fourths by volume solidified, showing the presence of rather more albumin than the blood would account for. Two of my colleagues agreed on the diagnosis of renal congestion. In accordance with this I was dry-cupped and purged for a week, when the urine became normal. Meanwhile, a specimen had been sent to Dr. V. C. Vaughan, of Ann Arbor, and tubercle-bacilli were detected.

I was then forty-two years of age, with no history of tuberculosis in any branch of the family. My health had always been good up to June, 1893. My weight at the time of illness (March, 1894) was one hundred and ninety-five pounds, and I was surprised at the diagnosis of genito-urinary tuberculosis made by Dr. Vaughan. However, I at once proceeded to Ann Arbor to place myself in his hands for treatment. He proposed the nuclein treatment, of which I had not even heard at that time.

After a day's consideration I decided to accept his plan and give it a trial. On March 20, 1894, the first injection of ½ drachm was given. The quantity was rapidly increased until the daily dose reached 1½ drachms, when chills, fever, vomiting, and general malaise supervened. The injections were discontinued until the unfavorable symptoms had disappeared, then resumed in smaller doses, about ½ drachm being the highest dose I could bear. With the large doses there was also a quite severe local reaction at the point of injection. A swelling four inches in diameter and two inches in thickness formed, and remained hot and painful for several days, but disappeared without suppuration. No pus ever formed at site of injection. From April 1 to November 20, 1894, daily injections were taken. My general health steadily improved; the local symptoms, which at no time amounted to more than slight uneasiness and a dull, heavy feeling at the neck of

the bladder, disappeared; only one hemorrhage occurred; at present my general health is excellent.

Wishing "to make assurance doubly sure," I called, June 8, 1895, upon a surgeon of international reputation in Chicago for a digital examination. A cursory examination satisfied him that I had tuberculosis of the left epididymis too far advanced for operation. Guaiacol and change to a mild climate were advised.

Two weeks later I was given a most searching examination by that brilliant diagnostician, Dr. John B. Murphy, of Chicago, who was unable to find any evidence whatever of tuberculosis. He suggested that if the urine gave no evidence of tuberculosis of the kidney, the disease had been eradicated,—cured. Acting on this suggestion, the urine was at once thoroughly examined at the University of Michigan Hospital, at Ann Arbor, with negative results. I therefore regard myself as having made a complete recovery.

The chemistry of the nucleins has not, I believe, been accurately determined. Foster's "Physiology" gives an approximate formula. It is agreed by all that it contains a high percentage of phosphorus in a non-toxic form. The first sample used was that manufactured in the laboratory of the Michigan University; later I used that made by Parke, Davis & Co., after the same formula.

When properly prepared and kept in glass-stoppered bottles it will keep indefinitely. When kept in cork-stoppered bottles decomposition occurs with the formation of toxins, which, when introduced into the circulation, produced the same symptoms produced by overdoses,—viz., chills, fever, nausea, and vomiting. There was never any suppuration at site of injection, but I still have nodules (painless) produced over a year ago.

I have used it myself in two cases of pulmonary tuberculosis. The first case was far advanced, a cavity having formed, there being hectic, night-sweats, emaciation, etc. No effect was produced.

In the second case the patient was treated for three weeks only. Two months later a cavity formed and a hemorrhage occurred. A trip to Florida was followed by great improvement. At last accounts the patient was living at Manitou, Col., and was free from tuberculosis.

I believe that in nuclein we have a remedy of great value, especially in the incipient stages of the disease. Its absolute innocuousness, its abundance and consequent cheapness, and its tonic properties are in sharp contrast to the toxic destructive action of some of the recently advocated remedies for this disease.

A CASE OF FRACTURED CLAVICLE IN A CHILD THREE MONTHS OLD, FOLLOWED BY NECROSIS.

By W. A. Haley, M.D, Durant, Indian Territory.

ON March 15 of this year there was brought to me a child exhibiting two discharging sinuses situated over the clavicle,—one near the acromial extremity, the other at the junction of the middle and inner thirds.

At the age of three months this child suffered from scarlet fever, and shortly after recovery from this disease the sinuses appeared. The physician in charge rightly diagnosed the presence of dead bone, but attributed this to scarlatinal necrosis. There was no tuberculosis in the immediate family. On carefully questioning the mother, it was learned that the child had fallen out of bed about the period it developed scarlet fever. It was supposed at the time that no injury had been inflicted and no surgical dressing was applied. When I first saw this child it was more than two years old and had suffered from the discharging sinuses from its third month. Before proceeding to operation, the child was prepared by administering divided doses of calomel and soda, followed by a saline. Since the child came from a malarial region, quinine was administered, 3 grains every three hours for four doses, and after that 3 grains three times a day. The sinuses were thoroughly cleansed daily with carbolic lotion. The area of operation was prepared by washing with Parke, Davis & Co.'s ethereal soap, followed by bichloride, 1 to 5000. Chloroform was administered, and an incision was made over the clavicle through almost its entire length. A detached piece of bone was removed, which showed that there had been a comminuted fracture, with two transverse breaks, communicating by a longitudinal fissure about an inch and a half in length. The acromial end of the bone was completely detached. There was no sign of union. The outer two-thirds of the bone were necrosed and easily removable. The granulations lining the cavity in which the necrosed fragments were lying were removed by means of curved scissors. The wound was cleaned by bichloride solution; the skin opening was sutured by sterile silk. A sterile dressing was then applied and the arm bandaged in the elbow position. The wound ran an aseptic course, healing promptly.

DIASTASE.

By E. B. Smith, M.D.,
Surgeon to Deaconess Hospital, Detroit;
AND
E. W. Tonkin, M.D.,
Bacteriologist and Pathologist to Deaconess Hospital.

ON taking a retrospective glance over the therapy of the past, we notice that years ago organic materials held the leading place in the materia medica; nearly every part of the animal economy was used as a medicament, and vegetable decoctions of almost every imaginable form were administered with a view of overcoming pathological conditions. The majority of these compounds were given irrationally, the scientific basis, when there happened to be any, not being understood, except superficially; for instance, when the glands of certain animals were given with the idea of strengthening the same glands in the patient. This system of mysterious and oftentimes disgusting medication was discontinued in later days; science had lent her aid, medical men were beginning to look upon disease in a different light, and a period of reaction set in, in which the inorganic materiæ medicæ held the first place, and chief among these, perhaps we are safe in saying, was mercury and its compounds.

Now we come to the age when we think we are reaching the happy medium; we use, it seems, as our ancient forefathers did, a majority of organic materials. We are confronted with toxins, antitoxins, nucleins, the extracts of digestive glands, testicles, thyroids, sheep's brain, and other corresponding preparations. We give pepsin for weak stomach, ox-gall when the liver is deficient in action, pancreatic ferments when that organ does not supply enough, and various others perhaps not so well known. The vegetable kingdom has been forced into our service for the preparation of many of these principles, a procedure that many doubt the utility of, but our chemists announce that the productions are precisely the same and produce the same results as those of animal origin. We must testify clinically.

Diastase, a ferment existing in the saliva, in the pancreatic juices, and in the secretion of Brunner's glands, is produced also by the growing fungi used in the process of malting, and more recently by the action of the eurotium oryzæ, a fungus pretty generally distributed, but only recently has its power in this direction been brought to light by a Japanese chemist. Diastase, as it exists in the various glands of the body, is probably identical, but some writers ascribe greater activity to that produced from Brunner's glands. A great difference of opinion exists with regard to the action of digestive ferments when administered medicinally; various objections have been raised against them in general; but it seems to us that diastase stands rather apart from the other ferments when considered as a medicinal agent. Pepsin and its analogues have been consigned to a very much less frequent use than they were a short time ago, and why will not diastase suffer a like fate?

It is generally conceded that rapid eating is a very fruitful source of dyspepsia. When such is the case the diastase of the saliva does not get a chance to get in its full work. Is it not so that a large number of so called dyspeptics suffer more from intestinal indigestion, and why is this? Salivary digestion, which should take place in the upper digestive tract, is almost a thing of the past with them; consequently more work is thrown on the lower digestive tract. The diastase of Brunner's glands and the pancreas have to do the whole work in half the time. The result is more or less intestinal indigestion when starch enters in any quantity into the food. In these cases we find it advantageous to administer diastase mixed with the food before eating or given immediately upon its ingestion. It is altogether probable, though, that diastase will assist us in the treatment of those cases that are not due to a lack of salivary digestion. In those cases it would be necessary to ascertain whether or not diastase is injured in its passage through the stomach. We know that it will not act in an acid medium; but will the action of the gastric juices destroy it so that when the fluids are neutralized in the intestine the diastase will not regain its power? This latter objection may be overcome by administering it in an enteric coated pill, or by mixing it with the food a sufficient time before eating.

It is to be remembered that the subject of our paper is diastase in a more or less pure form, and not the malted preparations, which, since they do not contain such a large percentage of active ferment, are not useful in the same way, perhaps, that diastase is in the pure state; but, nevertheless, a combination of the nutritive, digestive, and stimulant principles such as are found in these malt preparations has a wide field of use, and no doubt is a useful adjunct in the treatment of dyspepsia of any form.

At this point it may be of interest to describe briefly the process by which the diastase or so-

called taka diastase, the preparation which has been employed in our clinical experiments, is manufactured. Ordinary wheat bran is first carefully sterilized to rid it of any germs which may be present, and, after cooling, it is mixed with the native Japanese fungus growth taka-moashi in the proportion which has been found best adapted to the proper development of the diastatic fungus taka-koji. This mixture is exposed to a uniform moist temperature conducive to the growth of the fungus, which is complete in forty hours. From this taka-koji an extract is made by cold-water percolation, and the pure diastase is obtained by subsequent precipitation, appearing on the market as an almost white, practically odorless, and tasteless powder. On experimenting with this in the laboratory, it was found that it had the remarkable power of converting one hundred times its weight of dry starch, in the form of a paste, into sugar in ten minutes, or fifteen hundred times its weight in three hours. That the action was increased with the increase of heat within certain limits,—that is, up to about 55° C. That the action was best in slightly alkaline or neutral solutions, and stopped in acid or strong alkaline solutions, notwithstanding the fact that certain writers claim the contrary. That the converting action, even in the slightly alkaline or neutral solutions, came to a stand-still when the amount of sugar in solution reached a certain point. By placing the solutions in a dialyzer, however, thus removing more sugar than starch, we were enabled to observe the action more after the manner in which it would take place in the body. Diastase in this way converted a much larger percentage than when a dialyzer was not used.

Regarding the strength and action of diastase, however, experiments made in the laboratory are of limited value unless made upon animals; as those experiments made with solutions in flasks are open to several objections, and as it is impossible to remove sugar as fast as it is converted, which probably takes place in the body, we are not able to obtain the full action, since the diastatic power decreases as the amount of sugar increases. We have consequently supplemented our investigations on diastase by experimenting on the lower animals, as well as by using it clinically on the human being. We herewith present a brief *résumé* of the *clinical* work on the subject.

Mrs. O., from Canada, has been sick for five years, suffering from epigastric pain, loss of appetite, vomiting, acid eructations, and constipation; has been in the hands of able physicians the greater part of this time. Taka diastase was given, 5 grains after meals, which exaggerated the vomiting.

Mr. V. had suffered from dyspeptic trouble, and been under Dr. Smith's care for three or four years; had taken pepsin, arsenic, and bitter tonics, which only relieved for the time. Gave taka diastase, 6 grains after meals, with immediate relief. The constipation in this case was treated by giving rectal injections.

Mr. B. had pain, coming on about an hour after eating, with bloating; had been taking medicine on his own account. Taka diastase, 5 grains, relieved him.

Mrs. S. had fermentative dyspepsia of some months' duration, with diarrhœa. Gave taka diastase, 5 grains, with no results; but combined with bismuth subgallate, 4 grains, good results.

Mrs. E. had fermentative dyspepsia; had had pepsin, acidi hydrocyanic, dilute, before and after meals. This patient suffered with constipation. Taka diastase was given after meals, with an anti-constipation pill; relief.

Mr. S. had what he called "attacks of bilious sick headache;" this was a frontal headache, with a supraorbital pain extending across bridge of nose; suffered all the train of symptoms characteristic of dyspepsia; considerable relief from diastase. This patient suffered slightly from constipation.

Mr. B., stomach-trouble for some time; presented a coated tongue, pain after eating, bloating, frontal headache, and eructations. Taka diastase, 5 grains after meals, gave relief.

As a result of our experiments we have arrived at the following conclusions:

1. That diastase is suited for cases presenting, especially after taking much starchy food, the following symptoms. Epigastric weight and pain, bloating, drowsiness, frontal headache, with a superadded constipation.

2. That the dose may be smaller than indicated above, it being found that from ¼ to 3 grains are sufficient.

3. That it should be given just before or after eating, or may be mixed with the food.

4. That it relieves the constipation of these cases in this manner. It is a known fact that a colloid like unconverted starch prevents watery osmosis into the intestine; but when this same starch is converted into sugar it acts more after the manner of a crystalloid and sets up osmosis of liquids into the intestine, thus aiding the evacuation of the contents.

The Therapeutic Gazette

EDITED BY
H. A. HARE, M.D.,
GENERAL THERAPEUTICS.
AND
EDWARD MARTIN, M.D.,
SURGICAL AND GENITO-URINARY THERAPEUTICS.

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Leading Articles.

THE TREATMENT OF HOPELESS PHTHISIS.

WITHOUT any doubt the function of the physician called to treat a severe illness is a double one. His first efforts should be by the use of his remedial measures to produce a cure, if such a result is possible; and his second effort should be, whether ultimate cure can be reached or not, to so modify distressing symptoms which may be present as to relieve the patient of much suffering and unnecessary unrest. Of the chronic diseases with which we come in contact, cancer and tuberculosis afford the two best illustrations of what a physician can do for the relief of symptoms in incurable maladies, and because of the peculiar physical squalor into which many consumptives speedily pass, our efforts in this direction should be both rational and enthusiastic. At various times in the past physicians have written upon the methods which can be employed for the relief of such patients. One of the most notable of these articles, from the practical clinical stand-point, is that of Dr. John H. Musser, of Philadelphia, which was published in 1887, and we have on several occasions published abstracts in the Progress columns of the GAZETTE, giving the methods of equally well known members of the profession in the treatment of the complications of phthisis. One of the most interesting of these was the paper on the treatment of the gastric disorders of phthisis, which appeared originally in the *American Journal of the Medical Sciences*, by Dr. Habershon, an abstract of which we published in the THERAPEUTIC GAZETTE for March, 1893. Our attention has once more been called to this important subject not only by the constant needs of practice, but also by the article of Dr. Otis in the *Boston Medical and Surgical Journal* of June 20, 1895. As he points out, all cases of advanced phthisis are to be regarded as persons suffering from a state of sepsis, and it is a noteworthy fact that if we can remove the septic manifestations which the patient presents, we will do so much in improving his mental condition that what may seem a temporary arrest of the disease process may be obtained, and, as is well known, the hopefulness of the consumptive is easily stirred into enthusiasm by any improvement in his condition, if it be but temporary. After emphasizing the fact, which all of us should recognize, that plenty of fresh air and air space is an absolute necessity for every case of pulmonary tuberculosis, Otis tells us that, in addition to the regular meals, additional nourishment should be given by supplementary lunches, consisting of milk and egg, koumyss, cream and hot water, cocoa, or some light wine between the regular meals. If digestion is seriously impaired, artificially digested milk, containing soda water, Vichy, or Apollinaris, may be given. In other instances it will be found that the preparations of malt are most efficacious. Where there is evidence of fermentative dyspepsia after eating, a compressed tablet or powder of bismuth subnitrate 2 grains, pepsin 2 grains, and charcoal 5 grains may be given. Or, in its place, minute doses of creosote or carbolic acid may be used, not for their influence upon the pulmonary condition, but because of their antiseptic properties. Practically we have often found that these cases are much relieved and the appetite improved by a prescription such as follows:

℞ Dilute hydrochloric acid, ♏v;
Pepsin cordial, ♏xxx;
Compound tincture of gentian, enough to make a dessertspoonful.

This may be taken immediately after meals, or if it is desired to give the bitter before meals, the hydrochloric acid may be supplemented by 5 grains of bicarbonate of sodium in each dose. Should diarrhœa be a symptom, we would suggest the substitution of 5 drops of dilute nitric acid for the hydrochloric acid, because of its more astringent action; while, on the other hand, if constipation is found, cascara sagrada may be added to this prescription. The fever, which is sometimes an annoying symptom, has not been controlled with good results by the employment of guaiacol, nor have any of the antipyretic drugs acted well in this disease. Often cold spongings seem too severe for the patient, and in many cases it is not to be forgotten that absolute rest, either in bed in a well-ventilated room or on a couch out of doors, will do more to reduce the fever than anything else. Indeed, it has been the experience of climatologists abroad, in high Alpine resorts, that the patients can recline on comfortable couches well wrapped in furs, with a temperature many degrees below the freezing-point, with advantage, the exposure reducing the fever and actually benefiting the patient in other respects, chiefly by improving his appetite. In some portions of Germany it has been the custom to attempt to reduce the fever by the application of an ice-bag over the heart, but Otis's experience coincides with our own, —namely, that good results rarely follow this method. We have already pointed out, in a leading article in the THERAPEUTIC GAZETTE, the fact that we have found camphoric acid in the dose of 30 grains, an hour before the time of the expected attack, to be the most efficacious drug for the control of the sweats of phthisis. Otis, however, believes that he has gotten better results from the use of one-twelfth of a grain of agaracin than from any other remedy; but he emphasizes the fact that it must be given early, since its action is slowly developed.

The cough, after all, is one of the most annoying symptoms of advanced consumption, and many of the quack consumption cures depend for their popularity chiefly upon their power to check excessive cough. Without doubt, patients can teach themselves to some extent to control the cough, thereby saving themselves much distressing hacking and often preventing vomiting. Thus, Otis points out to us that, at Falkenstein, Detweiler told his patients that there was no more reason for their coughing whenever they felt like it than for their scratching whenever they felt like it, and that they should not do one in public any more than the other. While, of course, this advice is only applicable to a limited extent, it is to be urged upon many patients, particularly those of a nervous temperament. In some cases there is no doubt that we must frequently give cough sedatives. In the experience of the writer of this article an active preparation of cannabis indica accomplishes this very well; but Otis believes that codeine is very efficient, and we are inclined to agree with him to the extent of placing it second in the list. It can either be given in pill or in solution, in the dose of 1 or 2 teaspoonfuls of a one-per-cent. solution. In some cases of laryngeal phthisis with excessive cough, sipping small quantities of ice water will relieve the irritation, and in these patients it is always proper to cleanse the mucous membrane of the mouth, nose, and pharynx with Dobell's solution, followed by an oily solution of menthol to allay irritation. For the morning cough, which is nearly always troublesome, Otis suggests the use of some warm, alkaline drink, such as Apollinaris, soda water, Vichy, or Seltzer water, or a glass of milk with a little bicarbonate of sodium or common salt, and we think it important to emphasize this advice and the avoidance of the administration of true sedatives at this time of the day, since it is never to be forgotten that the early morning cough of phthisis, unless it be excessive, does the good work of freeing the cavities and bronchial tubes of the secretions which have been poured out during the night. Vomiting after eating is to be prevented by taking small quantities of food, to which may be added, if necessary, any one of the methods commonly employed to check excessive vomiting due to irritability of the stomach, and diarrhœa associated with much physical depression can be counteracted by the extract of kola bark, and to some extent by the administration of the elixir of guarana and celery.

We have already, in an earlier issue of the GAZETTE, spoken of what we believe to be the proper treatment of hæmoptysis, and we turn with interest to what Otis has to say in regard to this subject. He tells us that perfect rest in bed, an ice-bag over the heart, and opium in the form of morphine or codeine with ergot given hypodermically, is his method of treatment. He also advises, contrary to common usage, the employment of small quantities of alcohol, and he points out that Daremberg has urgently recommended in such cases the application of ice to the scrotum or vulva, the application being continued about five minutes. In place of ice, frozen compresses have also been recommended by Yeo. We have never employed this seemingly heroic treatment, and

Otis tells us that he has not used it, but it seems to us rational and worthy of trial.

Finally, it may not be out of place for us to urge the necessity of the consumptive who is bedridden changing the position of the body every few hours. In many instances this aids very materially in keeping the cavities empty, and so decreases the sepsis due to the absorption of toxic material.

PERMANGANATE OF POTASSIUM IN OPIUM-POISONING.

IN the Correspondence columns of the THERAPEUTIC GAZETTE of the August issue there appeared a brief note regarding a case of morphine poisoning, in which the patient is supposed to have ingested 30 grains of the sulphate of morphine, and in which recovery took place under a method of treatment in which the permanganate of potassium was largely administered hypodermically. And in this issue we publish the exhaustive research of Dr. Sharp on this topic. Notwithstanding these arrays of facts, our opinion in regard to the question remains unchanged and may be expressed as follows.

We think that there is little doubt that this substance, when given by the mouth during the time that morphine still remains in the stomach, possesses distinct antidotal influence, since by its powerful oxidizing properties it speedily destroys the alkaloid of opium. Even here, however, it should be remembered that the action of the permanganate in the human stomach must be far less efficacious, so far as oxidizing morphine is concerned, than it is when placed in a test-tube, since the presence of other contents of the stomach, of mucus, or the mucous membrane itself, to a certain extent helps to impair the full effect of the antidote. When it comes to the administration of the permanganate of potassium hypodermically for the purpose of acting as a chemical antidote in morphine-poisoning, we think that we have reached a *reductio ad absurdum*, for two reasons. In the first place, the permanganate of potassium possesses no powers which would enable it to act as a physiological antagonist to the influences of morphine, and the only way in which it can do good in poisoning by this drug rests upon its ability to oxidize the alkaloid. As a matter of fact, a solution of permanganate of potassium injected into the subcutaneous tissues is at once oxidized and changed into a different substance, and, therefore, can no longer act as the permanganate; and further, even if this chemical change did not take place, its hypodermic administration would be futile, since long before it could be absorbed and act upon the morphine, which is widely distributed in various portions of the body, it would have oxidized other substances which it might have met with in the blood or other tissues of the body. We are well aware of the fact that quite a number of cases of morphine-poisoning with recovery after hypodermic injections of permanganate have been reported within the last few months, but we have yet to see one in which strict scientific evidence was adduced that the recovery depended upon this method of treatment.

We doubt not that the hypodermic injections frequently administered have some influence in keeping the patient awake, or, in other words, of preventing him from forgetting to breathe, by reason of the pain which these hypodermic injections adduce. In other words, the recovery in these cases, if due to this method of treatment, rests upon the peripheral irritation which is caused, and not upon any action of the permanganate of potassium.

In the case which was reported by Dr. Suker in our Correspondence columns, it will be noticed that the patient received no less than nineteen hypodermic injections on an average every ten or fifteen minutes, which caused more or less swelling and discoloration of her arm, and that in addition she received that most powerful of stimulants, $\frac{1}{50}$ grain of nitroglycerin hypodermically, and $\frac{1}{6}$ grain of apomorphine; the first drug "acting nicely," according to the statement of the reporter.

MASSAGE IN THE TREATMENT OF LUXATIONS, BRUISES, AND CONTUSIONS.

THE growing popularity of this method, as applied to sprains, contusions, and dislocations, is well attested by the comparative frequency with which articles laudatory of massage, as applied to surgical affections, have appeared in the periodicals of the day. Of these,—many of them brief reports of cases, others more elaborate,—none is more noteworthy than the contribution of Van Arsdale and Gallant (*Medical News*, April 20, 1895). These gentlemen, as a result of an exceptionally wide experience, hold that massage will prevent swelling, pain, and stiffness, or, when these symptoms have become manifest, allay them promptly, and that it greatly shortens the time of treatment and permits of prompt use of the injured part. A mixture of equal

parts of ol. hyoscyami coct. (Ph.G.) and pure chloroform has proved in their hands the most serviceable lubricant. The treatment should be repeated twice daily, morning and afternoon, for half an hour at a time. After massage the joint should be rested for half an hour and then should be used. Elevation of the part between *séances* is always advisable. Van Arsdale thus describes the method of rubbing: Beginning well above the tender or swollen portion of the limb, gentle, systematic, upward strokes are carried well above the knee. These first strokes are made with the pulp of the fingers, both hands being used and held parallel with the leg. At first the sides of the leg are attacked, one by each hand; but soon more of the palmar surface of the fingers is brought into contact with the skin of the patient and gradually surrounds the whole circumference of the leg, each stroke being long and slow (not more than thirty to the minute). As the force of the pressure is gradually increased, the pulp of the thumb is brought into play, and the right hand supersedes the other in force and activity, until it will become necessary to grasp the lower part of the heel or the metatarsus, and make counter-traction, in order to steady the limb and permit of a greater development of force.

When the leg, by a change of color from blue to white, shows evidence of depletion of venous blood and lymph, the strokes may begin lower down and more directly over the seat of injury, always being carried upward, with the pressure exercised by the fingers,—delicate at first, but with ever increasing intensity,—with the thumb of one hand only, while the other hand steadies the foot in the most convenient position.

The tissues, which were hard and resistant to the touch at first, soon become softer and more elastic, and with this the pain at first experienced by the patient grows gradually less and his confidence in the operation increases.

From time to time, whenever the superficial veins of the leg that were first emptied appear engorged or swollen, it is considered imperative to continue the strokes upward to above the knee, and repeat the massage of the upper leg in order to evacuate the newly imported supply of blood and lymph well into the vessels of the thigh and, as it were, "drive the fluids home." In like manner the toes and the portions below the place of injury are visited and their tissues also are emptied of the stagnant fluids.

The region around the ankle is now considerably smaller, paler, and softer than at first, and the thumb, keeping up the upward stroking all the time, and moving with an independent action against the fingers placed opposite to it on the limb, busies itself finding out the special points around the joint where more marked hardness and stiffness may be felt, and in diving down between the bony projections and tendon sheaths, while it glides more lightly over the prominences and ridges of bone. The well-trained thumb is very quick at discovering the points of special soreness, even without the help of the patient's subjective sensations, and will make them special points of attack. When fatigue is experienced the hands are changed and the work carried on with the left.

Towards the end of the *séance*, which must be indicated by the patient's sensations and condition, the strokes are made to grow gradually more gentle again, and, becoming longer, extend from the foot well up to the knee, more closely resembling those described by some authors as effleurage. This procedure always gives the patient a sensation of pleasure and relief, and when the *séance* is ended he should be entirely free from pain, at least for a time. If he is not, it is a sign that the massage has not been properly applied.

Graham, in the *Edinburgh Medical Journal*, writing on the same topic, thus expresses his views: No two masseurs are alike by nature, nor in skill, tact, and education; and the one who knows his anatomy and physiology well, when called to a recent acute sprain, will not begin at once to massage the injured joint, but a distance above it, on the healthy tissues, by gently stroking or effleurage towards the heart, gradually proceeding nearer and nearer to the painful place. This has a soothing effect, and pushes the flow along in the veins and lymphatics, making more space in them for the returning currents coming from beyond the region worked upon, and carrying away the fluids that have leaked out of the vessels. The same should be done on the part of the limb beyond the joint, for the circulation is hindered, both in going out and coming in, by reason of the swelling. Next, the masseur who knows his business will begin again at a safe distance above the injured joint, and use deep rubbing, kneading, or massage properly so called, one hand contracting as the other relaxes, alternately making circular grasps, and this should be done on the parts above and below the seat of the sprain. By this procedure the effects of the previous stroking or effleurage are much enhanced, an analgesic or agreeably benumbing effect is produced upon the nerves, which extends to the painful place, and the retarded

circulation is pushed along more vigorously, making room in the vessels for the swelling, the effusion, the dammed embargo caused by the landslide of blood and lymph farther up the stream to float off, and preparing the way for the next step in the treatment. At the end of fifteen or twenty minutes of this manner of working, gentle firm pressure can be made immediately over the swollen and but recently very tender parts, which in a few seconds can have circular motion with the greatest push upward added to it; and this, if sufficient tact be used, will in all probability not hurt, but be positively agreeable. By this the effusion is spread over greater space, pressed out of the tissues as water is out of a sponge, and brought into more points of contact with the veins and lymphatics, by which it is absorbed and carried off, the same pressure that causes the dislodgement of stagnating fluids also aiding absorption by pressing them into the small vessels. Then a snug, well-fitting bandage should be applied.

Under this plan of treatment, used twice a day, the comfort produced and the speed of recovery would scarcely be believed unless experienced by one who had had a similar injury treated in the regular orthodox way, with absolute rest and immobility, by means of fixed dressings.

Some years ago the author published the results of massage in more than seven hundred cases of sprains, joint contusions, and distortions, of all degrees of severity, treated by many different observers, most of whom were French, German, and Scandinavian army surgeons, in order to confirm the experience obtained in some of his own cases.

The invariable result of each and all was that such injuries thus treated got well in one-third of the time that similar cases did under the usual method of absolute rest and fixation, and with less tendency to subsequent weakness, pain, and stiffness.

Experience teaches that the sooner after a sprain massage is begun the quicker is the recovery. In Germany the military authorities now require a semi-annual report from their surgeons upon the results of massage in injuries of joints; and the statistics of Gassner, Starke, Korner, and others clearly show the rapid results of this method, and the economy of time to the soldier. He fears that it will be a long time before many of the physicians and surgeons in the United States will condescend to try their hands at massage. Indeed, most physicians adopt, prescribe, or tolerate massage in the same way that Constantine the Great embraced Christianity,—more from policy than from conviction.

Graham, further, quotes the experiments of Mosengeil, who injected into corresponding joints of rabbits India-ink. With each rabbit he masséed one of the joints at regular intervals, and left the corresponding joints on the other limb untouched. The swelling and stiffness caused by injection rapidly disappeared under massage, and on examination of the masséed joint after the animal was killed it was found emptied of its contents. On microscopic examination it was seen that the greater portion of it had been forced into and penetrated through the synovial membrane. In the joints which had not been masséed the India-ink was found in the joint mixed with the synovia, forming a smeary mass, and it had not even penetrated the tissue of the synovial membrane.

The same results were uniformly obtained in all the experiments, showing that absorption takes place from joint cavities by means of lymph spaces and small openings communicating with lymphatic vessels, and through these with lymphatic glands.

Castex (*Archives Générales de Médecine* for 1891 and 1892) experimented on dogs for the purpose of observing the effect of massage after injuries. The injuries were intentionally produced in corresponding places in two limbs of a dog. The seat of one of these injuries was masséed, one was left alone, and the tissues that were hurt were examined under a microscope. The more injured limb was always chosen for treatment, and the other had no massage, but was left to the natural evolutions of the injuries. The effects, immediate, consecutive, and remote, were carefully observed by experts in laboratory work, who were not told which leg had been masséed.

Massage was done immediately or very soon after the injuries; even in the case of dislocations, as soon as these were set, and always with remarkable relief to the pain, swelling, and stiffness, so much so that after a few massages of stroking or kneading of five or ten minutes each once a day the dog had full use of the leg that had been masséed, whereas the leg that had not been masséed remained swollen, stiff, and painful for a long time, and in some cases did not recover at all.

The experimenter states that no matter how severely the dogs are injured, especially the Scotch shepherd dogs, they do not seem to mind it at all after it is over, running about as if nothing had happened as soon as they are set at liberty.

All the experiments tended to one conclusion; one typical result is quoted. The two shoulder-joints of a large watch-dog were dislocated by inward flexion. The head of the humerus of each was plainly visible under the skin, showing a luxation forward and inward,—intracoracoid. It was easily reduced by traction. Five minutes of massage was at once given to the right shoulder, which seemed to afford relief, judging from the gratified way in which the animal submitted, and after this a figure-of-eight bandage was applied around both shoulders. The dog had massage for five minutes daily to the right shoulder alone, and for the first three days he walked with difficulty. The right shoulder gradually became less painful to touch, and he stood firmer on that side. On the fourth and subsequent days all sorts of pressure upon the masséed side were borne without discomfort, but when the other shoulder was pressed, the dog growled and attempted to bite. Six days after the dislocations he supported himself well on the masséed limb, but held the other up, and the non-masséed shoulder was still swollen and painful. Both shoulders then stayed in place, in spite of passive movements that might have dislocated them. On the eighth day the dog walked well with the masséed limb, but held the other up, and the latter was still swollen and painful, and there was crepitation in the joint. Thirteen days after the injuries the dog took an occasional step with the limb that had not been masséed, and two months later it was in about the same condition, while he freely used the limb that had been masséed in walking and running.

There was then atrophy of the muscles of the left shoulder, evident by the prominence of the bones; none of the muscles of the right.

Soon after the swelling from the injuries to the dogs had subsided, the muscles became more or less atrophied in the limb that had not been masséed, but not at all in the limb that had been masséed. At the end of five or six months the dogs were killed and the tissues examined under the microscope. The muscular tissue of the side that had not been masséed presented a diffuse sclerosis; the connective tissue intervening between the fibres and bundles of fibres was thickened; there were interstitial hemorrhages, especially in the cellular tissue around the muscles; the internal and external coverings of the bundles of muscular fibres (perimysia) were infiltrated with blood, and also the fascia outside of this. The transverse markings of the muscular fibres (striæ) were effaced in many places, while the longitudinal striation or marking which is not seen normally was very distinct. The muscular tissue from the corresponding region that had been masséed was found to be natural in every respect. Castex has forgotten to mention the appearance of the sarcolemma. In all probability this also was hardened, thickened, and infiltrated with blood, as were the outer and larger coverings.

The blood-vessels appeared perfectly natural from the masséed side, but those from the side that had not been masséed presented a hyperplasia of their external coat.

The nerve filaments were found to be normal in the masséed side, while in the side that had not been masséed there were abundant evidences of perineuritis and interstitial neuritis exerting distinct compression of the nerve fibres. The nerve-sheath was at least three times as thick in the non-masséed side, and the connective tissue around the perineurium was also thickened with numerous new-formed cells. The small vessels in the perineurium were also the seat of a peripheral hyperplasia or thickening. The lesion of the nerves was more marked than that of the vessels.

In human beings Castex found that when massage was begun early or from the very first in contusions, sprains, and dislocations, not only were the immediate symptoms relieved, but also the subsequent serious consequences that are so apt to follow these injuries. Wasting weakness, contractions, and stiffness were prevented. But when he tried massage in old cases of muscular atrophy or wasting following joint injuries, he got no increase of muscular tissue. The stiffness was removed, the muscles became suppler, but they still remained thin and lacking in strength. If he had combined passive and active movements with the massage, Graham suggests that he would probably have obtained growth and strength of muscle. He found the galvanic and faradic currents of benefit in promoting increase of muscular tissue. Muscular contraction from electricity is but another form of motion.

Numerous theories as to the cause of muscular atrophy from injuries of joints have been considered and abandoned. The injury to the joint starts up more or less arthritis; the articular nerves are irritated; this irritation is transferred to the spinal cord; the nerve-centres affected act in turn upon the centrifugal nerves going to the muscles, and these determine at their peripheral ends the muscular atrophy. With a view to the elucidation of this, Deroche has repeated seven times, and al-

ways with the same results, experiments which were done for the first time at the College of France by Raymond and Ovanoff. He divided the posterior roots of the last three lumbar nerves of the left side in dogs and rabbits. After cicatrization had taken place, he assured himself that numbness was complete from the thigh to the knee of the left lower limb, so that irritation of this region was not felt. The corresponding limb was left intact. An arthritis was then set up in both knees by introducing a thermo-cautery into them. No pain was felt in the left knee, but much in the right. Three months afterwards the animals were killed, and in both knees the lesions of arthritis were found; but the muscles of the thigh of the left limb were of normal size, of the right atrophied.

THE INDEX MEDICUS.

THE THERAPEUTIC GAZETTE has taken occasion from time to time to urge upon its readers the necessity of coming forward with subscriptions for the support of the *Index Medicus*, a publication which is not only a necessity for those who desire to keep in touch with medical literature, but a credit to the profession of medicine in America. Within the last few weeks a very active movement has been carried forward for the purpose of raising a sufficient sum to defray the actual expenses of the publication of the *Index*, for immediately upon its discontinuance, several months since, many individuals found themselves unable to carry on their professional work without it. The following gentlemen have already become subscribers at the rate of twenty-five dollars a year, and it is earnestly hoped that additional subscribers may be obtained in order that the full amount necessary may be raised. As the benefits of the *Index* extend from year to year, it is necessary that its publication should not be jeopardized every January by the possibility of a great falling off in its subscribers, and it is hoped that all those who subscribe at this time will continue their subscriptions year after year in order that no doubt may be felt as to the future of the publication of the *Index*.

Subscriptions should be sent to the publisher, Mr. George S. Davis, Detroit, Michigan, who, it is to be remembered, takes the responsibility of the publication of the *Index*, and asks nothing more than that he shall not be at a heavy loss each year in its publication. In other words, he publishes the work entirely without profit to himself, because he recognizes its value.

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Reports on Therapeutic Progress.

TWO CASES OF LARYNGEAL DIPHTHERIA INTUBATED; TREATED WITH THE ANTITOXIN, FOLLOWED BY DEATH.

ROSENTHAL details his cases in the *Medical News* of May 25, 1895, and thinks that the only conclusion to come to is this: while the administration of the antitoxin was correct and the intubation was correct, the further treatment of the cases lacked—what is now understood and now written by the first observers—a continuance of the same method of treatment. In other words, when elevation of temperature, pulse-rate, and respiration is found to continue after the administration of a suitable dose of antitoxin, the fact would appear to be an indication that the toxins in the individuals have not been neutralized, and an immediate and larger supply of the serum is called for. For example, after administering an injection of No. 2 Behring's serum, and four hours afterwards the disease progresses and the temperature rises instead of falls, we should administer at once another bottle of No. 2 or 3, and so continue until a reaction and correct fall take place, so well described by Kossel, Ehrlich, and others. The writer has pursued this method since and has had no further failure to record.

REMARKS ON THE THERAPEUTIC INDICATIONS IN TYPHOID FEVER AND ON ITS TREATMENT BY MERCURY AND IRON.

EWART concludes a paper on this subject in the *Medical Press and Circular* for May 15, 1895, as follows:

Bearing in mind the non-fatal tendency of the first stage of the disease, and the absence at that stage of any local lesion which would expose the gut to any mechanical dangers, two indications present themselves,—(1) to clear the bowel of as much offending matter as possible; (2) to restore the mucous membrane, at least *pro tempore*, to as healthy a condition as possible, so that food may be absorbed.

1. The indication suggested is often carried out in a modified way by the administration of castor oil in cases which may not yet be clearly diagnosed; but in others the occurrence of diarrhœa at the outset may lead to a different treatment. The difficulty is most often to obtain an early opportunity of seeing the patient and to be able to form a diagnosis from the first. If this could be done, an opportunity might be afforded for mild and cautious, but systematic, purgation during the first two or three days, whether the case was one with a tendency to diarrhœa or with prevailing constipation. The best agent would probably be calomel first in a purgative dose, followed up by doses of ¼ to ⅓ grain repeated three or four times daily, and, if necessary, combined with small doses of opium, or, on the contrary, supplemented with more active aperients. This form of treatment has already been recommended by Professor Latham in his lectures on enteric fever published in the *Lancet* for 1893.

2. During the first days, anorexia being absolute, a strict fever diet would add to the value of the derivative treatment by relieving the mucous membrane of all digestive effort. As soon as this preliminary treatment had produced an improvement in the appetite and in the state of the tongue, an opportunity might be given, which in the usual treatment of enteric fever we are apt to miss, for preparing the patient, by varied and nutritive, though light, supplies (such as leave little insoluble residue), for the long period of comparative starvation through which he must ultimately pass. We must remember that at this stage—the first and second week—the passage of soft fæces over the swollen but not ulcerated patches could in no way be a source of danger, the original purgation having disposed of any hardened matter which might previously have been retained. Under these circumstances, and at this stage, a moderate peristalsis is less to be dreaded than inactivity of the bowel, with retention of large quantities of contaminated fluids; and, above all, than the starving of tissues, which have, later on, to go through a process of sloughing ulceration.

The advantage of mercury as an aperient lies in its antiseptic properties, which carry out from the first the leading indication, even though the special treatment, presently to be described, be deferred for a few days. As a rule, there is no reason for any delay, and in view of the demonstrably serial reinfections which often occur, it cannot be begun too early.

Various antiseptic medicines have been proposed, but none has proved completely successful, and against some of them definite objections have been raised. The best form of antiseptic remedy will be one which, while chemically active against the poison, is not only harmless, but beneficial to the mucous membrane and to the system. He has not obtained these advantages from any remedy such as carbolic acid, carbonate of guaiacol, β naphtol, naphtaline, salol, thymol, boracic acid, chlorine, chloroform, etc., most of which he has tried. As to the antipyretic group—antipyrin, antifebrin, phenacetin, etc.—and to quinine itself, it cannot be said that we have any evidence that they control in sufficient degree the infective process.

In the second volume of the *British Medical Journal* for 1894, page 1126, Mr. W. B. Wedgwood, of King's Lynn, published the results of a series of twenty-one consecutive cases treated by him with the perchlorides of mercury and of iron. Doses of 20 minims of the tr. ferri perchlor. and of 30 minims of the liq. hydrarg. perchlor. were administered every four hours steadily throughout the attack. All the cases recovered. In no case did the temperature rise above 104° F. Diarrhœa was slight. Hemorrhage did not occur, though epistaxis occurred in four cases. No complications arose. In none of the cases did the fever continue beyond the third week. In no case was it necessary to discontinue the administration, no symptom of mercurialization being noted.

The statement of these favorable results was followed up by the publication (*British Medical Journal*, 1894, ii. p. 1302) of an equally encouraging report by Dr. Geo. W. Crowe, physician to the Worcester Infirmary, who had treated all his cases for eighteen years with drachm doses of the perchloride of mercury solution, administered three times a day. "The mortality has been low and the course of the disease has been shortened. He has never seen any ill results follow, and diarrhœa has been the exception."

On the first occasion which presented, Mr. Wedgwood's method was tried, and the writer has applied it in every subsequent case under his care. Every instance in which the administration was kept up completely justified the original statements made by Mr. Wedgwood as regards control of diarrhœa, cleaning of tongue, lowering of temperature, brightening of complexion and of the faculties; in a word, improvement in every direction and rapid convalescence. Unfortunately, in some cases there was, or appeared to be, intolerance of the remedy. The vomiting and diarrhœa set up were in some cases—as suggested to the writer by Dr. Russell Wells—probably due to the action of the metals on the milk. For this reason he has made it a rule that no milk is to be given for one hour before and for half an hour after the dose. In spite of this precaution, several cases have proved refractory. Bilious vomiting and watery diarrhœa with shreds caused the treatment to be discontinued after so brief a trial that these cases cannot be regarded as having been under the full influence of the remedy. Four instances of this kind occurred, the case related being one of them, and in all of them the disease ran a severe and fatal course. One case was not examined after death, but in the other three extensive ulceration of the colon and of the ilium was found.

The author's experience of the method causes him to regard it as the best treatment for the generality of cases; its general tonic effect on the nervous system, its beneficial results on the blood, the liver, and the mucous membrane,

and the control it exercises over the diarrhœa are beyond doubt. The last-named advantage is partly brought about by local antisepsis, although this is difficult to prove, and partly by the astringent properties of the iron.

In the second place, its administration has served as a test for the severity of the cases and also as regards the extent of the lesions. He bases a most anxious prognosis on intolerance of the remedy; while all cases, including some with well-marked "typhoid" aspect (delirium, sordes, etc.), in which it was tolerated, recovered, the symptoms yielding in an unmistakably direct way to the treatment.

It may be that when begun after the second week (and in none of the fatal cases did the opportunity for treatment arise quite so early) the medicine may come too late, and may act as an irritant to an intestine already ulcerated or severely inflamed; this would be an argument for its early administration in every case. He thinks it probable that the same kind of treatment, with some simple modification in its form, may be found suitable to cases apparently intolerant of it, such as those referred to, in which it was, perhaps, too readily given up, and in which it cannot be said to have had a fair trial.

The object of this paper has been to give the author's testimony in favor of a treatment which in a majority of cases has been productive of so much good, and which seems to have transformed some of them, which might otherwise have turned out badly, into relatively mild cases.

INTRAVENOUS SUBLIMATE INJECTIONS IN CEREBRAL SYPHILIS.

Bruni (*Il Policlinico*, May 11, 1895) records the following case, which he looks upon as being one of undoubted cerebral syphilis: A man, aged twenty-five, was seized with convulsions. They were limited to the right side, and recurred from one to three times in the day. In addition, he had severe pain in the left side of the head. About four years previously he had contracted syphilis. The author says that the history—absence of fever, regularity of the pulse, etc.—made him think that the Jacksonian epilepsy was due to a gumma in the left Rolandic area. He treated the patient at first with intramuscular injections of mercury and potassic iodide by the mouth. As there was no improvement by the seventh day, 3 milligrammes of corrosive sublimate in solution were injected into the left median cephalic vein after Bacelli's method (*Epitome*, April 7, 1894, par. 283). This was repeated on the following day, and the dose was steadily increased up to 6 milligrammes. In all, sixteen intravenous injections were given. From considerations of convenience, mercurial inunction was then adopted. The fits ceased after the second intravenous injection, and the pain in the head also disappeared. Good reports of the patient were received for some time after. The author then gives details as to the technique of the method. It is useful and even necessary to have recourse to these intravenous injections in cases in which other mercurial treatment has failed, in severe cases of cerebral syphilis, and in patients who cannot be subjected to treatment with large doses of mercury.—*British Medical Journal*, June 8, 1895.

PHYSIOLOGICAL ACTION OF ANTIDIPHTHERITIC SERUM.

Mya (*Lo Sperimentale*, April 11, 1895) has investigated the physiological action of the serum in children not suffering from diphtheria. They were cases of slight measles, malarial cachexia, mild rickets, and slight laryngeal catarrh. The ages were six years, eighteen months, two years, and twenty-nine months respectively. In these four cases there was no noteworthy action on the circulatory apparatus or kidneys. In the case of mild measles, slight arhythmia, noted before injection, was not aggravated by it. The author says that this arhythmia is sometimes seen in children after infectious diseases. No changes were produced in the temperature, except in one case, in which a scarlatiniform rash appeared. A slight increase in the quantity of urine was observed and also in the amount of urea. The most obvious change was noted in the blood, and consisted in an increase of the white cells and a diminution of the red cells immediately after the injection; it was transitory, not lasting more than twenty-four to forty-eight hours, and was not accompanied by any alteration in the coloring-matters of the urine. The author's results correspond with those of Zagari and Calabrese, but he does not agree that there was any hæmolytic action exercised by the serum. He thinks that the injection of a heterogeneous serum causes a dilution of the blood, which is brought about by the absorption of lymph. Sevestre has lately shown that the injection of horse's serum produces fever and urticaria in children. Mya is of opinion that the antidiphtheritic serum exercises no noxious action such as can be appreciated by present methods of examination, and that disturbances hitherto noted have been

due to the lymphagogue action of the horse's serum introduced subcutaneously. — *British Medical Journal*, May 18, 1895.

SOME CLINICAL FACTS ABOUT YELLOW FEVER.

In the *Medical Record* for May 25, 1895, STUBBERT, of Nicaragua, states that in San Salvador there is an opportunity of comparing the treatment of the American, German, and French schools (most of the native physicians being thoroughly imbued with the tenets of the last-named system). Practical results are decidedly in favor of our American method of treatment, the death-rate having been only eleven per cent. among those treated according to the teachings of Professor Loomis and other well-known American authors. There is no doubt at all as to the beneficial effects of quinine administered during the early part of the first stage; not that it cuts short the course of the malady, as in pernicious fever, but because it appears to prevent dangerous exacerbations of temperature and to render less severe the third stage. Owing to the great danger of suppression of urine, it is the writer's practice to administer nitro-glycerin in $\frac{1}{100}$-grain doses, and after a free flow of urine is established, to administer digitalis and saline diuretics, according to circumstances. Vichy and milk in large quantities are used by all schools here. Kola is strongly advocated by the French and German physicians, but the writer has found it of no special value and very distasteful to the patient. When vomiting begins, the most successful treatment seems to be a full dose of ipecac, followed by large quantities of tepid water, in turn followed by a hypodermic of $\frac{1}{8}$ grain of the sulphate of morphine, to quiet the stomach. When albuminuria appears, the patients become excessively nervous, throwing themselves constantly from one side of the bed to the other, necessitating very small doses of morphine. He has never found it necessary to administer more than six doses of morphine throughout the whole course of the disease, or to produce emesis by ipecac more than twice. Cracked ice and carbolic acid in peppermint-water are generally sufficient to control the nausea; but where they are not, in spite of the fact that the use of opiates is so strongly condemned, the writer administers them. Enemas of brandy and carbolic acid solution for stimulant and antiseptic effects have proved of great value.

Unfortunately, so much has been said about yellow fever being a self-limited disease, requiring more than all else good nursing, that it is no uncommon thing to see cases "left to nature" until the critical moment has passed. The treatment, to be successful, must be symptomatic, prompt, and energetic; and the sheet-anchors are free catharsis, diuresis, and diaphoresis at the beginning, with large doses of quinine hypodermically. After that mild catharsis and free diuresis through the disease, emesis when the vomiting is turning from white to yellow, morphine when necessary to control vomiting or to overcome extreme nervous jactitations, and finally cardiac stimulants when indicated, generally from the beginning of the second stage.

Prophylaxis has demanded the attention of Gasteazoro and the writer, but they have not been able to arrive at any satisfactory conclusion. Perhaps salol, in doses sufficient at first to produce optical symptoms and green urine, and subsequently in daily doses of 5 grains, accompanied by an open condition of the bowels, will be sufficient protection. There seems to be good ground also for the weekly exhibition of small doses of calomel.

A CASE OF DIABETES INSIPIDUS TREATED BY INGESTION OF SUPRARENAL GLANDS.

In the *British Medical Journal* for May 18, 1895, CLARK mentions that a great many cases have been reported in the *British Medical Journal*, in which the thyroid gland, or its extracts, has been used in the treatment of various diseases. The following case, in which the suprarenal capsules were used, may, therefore, be of interest.

Mrs. A., aged thirty-nine, the mother of four children, was found, on May 13, 1893, to be suffering from diabetes insipidus. She then for some months attended the London Hospital as out-patient, but considered that she steadily grew worse.

On May 6, 1894, the writer attended her in a confinement. Her condition of extreme debility made him a little anxious, but she made a good recovery so far as the confinement was concerned. She was in hopes that "the child would take the disease," but found that her condition was unchanged.

On May 24 she passed the usual quantity of water (two gallons) during the night only. The urine was characteristic: pale, slightly alkaline, specific gravity 1005, containing neither sugar nor albumin. She complained of great thirst, weakness, and continued loss of flesh, and she had little sleep, but spent the night in getting into and out of bed. She was only able to move about the house.

He then gave her half of one suprarenal of a sheep every third night, chopped fine and taken in a small sandwich. About two hours after taking it she felt very hot and giddy,—so giddy that she could not stand. A moderate perspiration followed, and she slept. The thirst was much diminished, she passed less urine, felt stronger, and had much more sleep.

On May 30 she, by mistake, took one whole capsule. The giddiness was much increased, she felt very faint and thought she would die, and suffered from restlessness all night.

On June 5 her weight was eight stone thirteen pounds. The urine passed was five quarts in twenty-four hours, slightly alkaline; specific gravity, 1008.

On June 8 the urine passed during the night only amounted to one quart, though on most nights it was two quarts. He then ordered half a capsule every second night. Finding some difficulty in procuring fresh glands, he wrote to one of the large manufacturing chemists, who sent some tabloids of dried glands, and on June 10 he gave one tabloid every other night; but as the patient complained much of the giddiness, he reduced the dose to half a tabloid.

On June 19 the amount of urine voided during the night was one quart, but on the nights on which the half tabloid was taken it was always more,—about two quarts. The patient complaining of indigestion, he gave her a mixture containing rhubarb and soda before food and a glass of port wine with her dinner. She said she felt much stronger, but did not apparently gain flesh.

On July 31 she felt much better; a sick child gave her a bad night. The urine measured four quarts in twenty-four hours; specific gravity, 1006; alkaline. The dose was increased to one tabloid every other night.

On September 3 she still felt better. The urine measured three quarts in twenty-four hours; it was slightly acid, of specific gravity 1009, and contained 180 grains of urea. She did not take any tabloids for a week, and the urine doubled in quantity.

On October 6 she passed three pints in twenty-four hours; it was neutral, the specific gravity 1010, and the amount of urea 210 grains; and on November 3, having been three days without taking the drug, she passed seven pints of urine in twenty-four hours; specific gravity 1009, and the urea 210 grains.

On January 20, 1895, having been three weeks without taking the glands, the urine passed was about six quarts in twenty-four hours, with great thirst and weakness. Two fresh glands were then taken at intervals of three days, and the amount of urine was reduced to three quarts and half a pint in twenty-four hours.

On February 27 she was taking one fresh gland every third night, and the urine passed amounted to three pints in twenty-four hours.

On March 15 her condition was the same.

On April 2 she had stopped taking the glands, and the urine was increasing in quantity.

He had great difficulty in inducing the patient to continue the treatment with regularity, so as to give him opportunities for accurate observations.

He was led to try the effect of the adrenals by remembering the large nerve-supply accompanying their blood-vessels, which might or might not influence the nerve governing the blood-supply of the kidneys, both being derived from the semilunar ganglia. Whether the effect is thus produced, or whether it is the result of the tonic effect alleged to be induced by the ingestion of the adrenal substance on the blood-vessels of the system generally, he cannot say, but in the case reported he finds that,—

1. The urine has been reduced in amount from four gallons to three pints in twenty-four hours.

2. The general health and strength have been much improved. The patient, who before could hardly move about the house, can now walk several miles, can do all the work of the house, and can attend to her children.

3. So long as she takes the glands the urine is moderate in quantity, but when she ceases taking them the urine increases in amount and great thirst and weakness result.

Though the amount of urine passed has so much diminished, it is a striking fact that the quantity of urea excreted should remain so small. Though so much stronger, her weight has not increased. The glands from frozen mutton appeared to have much less effect than those from mutton recently killed.

A MODERATE VIEW OF THE ANTITOXIN TREATMENT OF DIPHTHERIA.

In the *Journal de Clinique et de Thérapeutique Infantiles* for May 16 there is an article by a well-known physician of the Hôpital Trousseau, DR. G. VARIOT, in which he says that, according to his observation, while the antitoxin treatment gives brilliant results in ordinary cases of pharyngeal diphtheria, and especially

in cases in which laryngeal stenosis is the main source of danger, it fails constantly in what he calls toxic cases, those in which death is due to general poisoning, the chief effect of the poison falling upon the heart and the peripheral vessels, with a great reduction of the amount of urine excreted or its total suppression. But he reflects that the experience which had led him to this conclusion had been in hospital practice, and that children affected with this form of diphtheria are seldom or never sent into a hospital early in its course, and do not usually receive the antitoxin treatment at their homes. Even this saving reflection, however, has been upset by his having recently seen the treatment fail in a case in which he was able to employ it from the outset of the disease. He gives the history of this case and of fifteen other fatal cases.

Save in a few exceptional instances, says M. Variot, where death takes place with lightning rapidity, the powerful action of the serum in the way of opposing membranous exudation suffices to relieve the throat. The glandular swelling and the infiltration of the neck are reduced, the general condition is ameliorated for the time being, and the child takes food and regains its vivacity. But this is a deceptive remission; at the end of two or three days the face becomes pale, general prostration supervenes, and the pulse intermits and then is altogether imperceptible. This pulselessness often persists for two or three days before death occurs, although the heart, of course, keeps on beating to the last. The limbs are cold, but not cyanotic, and M. Variot says that certain features of the child's condition remind one of the algid phase of Asiatic cholera.

Nevertheless, he says, in conclusion, we should not be discouraged or underrate the immense value of the antitoxin treatment. If it is useless in these toxic cases, even when employed from the start, it yet has the precious property of causing the false membranes to disappear, even in the gravest cases; the enormous reduction of the mortality from croup is incontestably due to the rapid casting off of the exudate caused by the serum. The phenomena of laryngeal obstruction do not persist after the injections; the action of steam generally suffices to relieve the remnants of them, temporary intubation, for two or three days, wards off suffocation in the few cases that call for it, and tracheotomy, at least in hospital practice, is destined to grow rarer and rarer.

Finally, M. Variot questions the antitoxic action of the serum. If, he says, it were really antitoxin, it would be strange that its antitoxic action should cease to be manifest in the very cases where it was most necessary. It certainly counteracts the formation of false membranes, but its antitoxic power is extremely doubtful, at least when the disease is actually developed. Not only does it fail to prevent death in the toxic forms properly so called, but it does not avert the partial paralyses of convalescence, which are themselves only mitigated toxic manifestations.—Editorial in the *New York Medical Journal* for June 1, 1895.

THE TREATMENT OF A PATIENT BEFORE AND AFTER THE USE OF AN ANÆSTHETIC

FINGLAND writes a practical paper in the *Edinburgh Medical Journal* for May, 1895, upon this subject.

The following directions, which may be modified in particular cases, should be carried out, in his opinion, before and after operations of longer or shorter duration.

Before laying down rules for the regulation of diet, we will refer to a matter of great importance in connection with our subject,—namely, the hour of administration. In exceptional and urgent cases, of course, this is not a matter for consideration. There is very little doubt but that the early morning—from 8 A.M. to 10 A.M.—is the best time for the administration of an anæsthetic for a surgical operation. Excepting patients of a nervous and apprehensive temperament, and cases of exhausting diseases where the vitality is very low, patients exhibit a greater amount of cheerfulness in the morning than in any other part of the day. They have probably had some hours of refreshing sleep, and, moreover, the stomach is empty, for a full stomach interferes with successful narcosis and leads to vomiting with its unpleasant sequela. The next best time for the administration of an anæsthetic is from 1 P.M. to 2 P.M., for at this time the patient will have been accustomed to take his mid-day meal of either lunch or dinner, and will, therefore, have several hours intervening for the entire digestion of a light and easily assimilated breakfast. In cases where these times are not suitable, the patient, as a general rule, should not have any food whatever for four hours previous to the operation.

As the following remarks on diet will apply more or less to hospital patients, it will be as well to state here that in private practice, where it is usual to operate in the morning, there is no occasion to give the patient any food in the early morning, excepting in those cases of old

and enfeebled patients, where the surgeon will give special directions. It must, however, be borne in mind that an unduly prolonged fast is most undesirable, and, apart from its depressant effects on the patient, is conducive to sickness, and the anæsthesia is not so satisfactory as might be wished. In every case an aperient should be administered the night before the operation, and especially in bilious and plethoric patients this should be followed by an enema in the morning. The selection of the most suitable aperient for the state of each patient will rest with the surgeon. The most usual are the compound colocynth pill, the fluid extract of cascara, compound licorice powder, or a draught containing magnesium sulphate and dilute sulphuric acid. The matutinal enema may be made by diffusing one ounce of finely powdered white soap in fifteen ounces of warm water, to which one ounce of olive oil may be added, if thought desirable.

It is to be clearly understood that in many cases care should be exercised in the administration of the aperient, and the subsequent depression borne in mind, so that vigorous purgation may be carefully avoided. It is also a good plan to let the patient have a warm bath the night before the day of operation. By these means the best conditions subsequent to the operation are secured and the probability of vomiting almost entirely removed.

Now as to regimen. The fewer and simpler the articles of diet the better. Milk, eggs, and their combinations are to be avoided. The writer has seen undigested milk vomited by young children after several hours' fasting, who were unconscious that any operation was about to take place. This occurrence is not uncommon in adults; but it is probable that the process of digestion is interfered with by apprehension or fear on the part of the patient.

If the operation is to take place from 8 A.M. to 10 A.M., the patient may have a cup of tea and some toast or bread and butter at 4 A.M. or 5 A.M., but nothing more before the operation. If the operation is to take place at 1 P.M. to 2 P.M., the patient may have breakfast as above, and at 9 A.M. a breakfast-cup of beef-tea or clear soup fortified with a teaspoonful of extract of meat, with some pieces of dry toast, or a little sherry may be added to either, if desired.

In private practice, if the middle of the day is chosen as the time for operation, the breakfast, as directed, at 8 A.M. or 9 A.M. is all that will be necessary.

Patients of advanced age, exhausted condition, or low vitality, and also alcoholics, should have 1 or 2 tablespoonfuls of brandy, with an equal quantity of cold water, half an hour before the time for operation; but the administration of stimulants to patients before operation as a matter of routine is not to be recommended. Brandy is also best administered in the form of an enema.

The nurse should be careful to remove any artificial teeth the patient may be wearing previous to the case leaving the ward. The clothing should be warm and easily removable. The neck and chest should be quite free, and anything which restricts free thoracic and abdominal movements should be loosened.

After the operation is completed, an additional warm blanket should be in readiness to cover the patient; and in removing him to bed or to the ward, especial care should be taken against taking cold in cases where ether has been administered. He has seen several cases of broncho-pneumonia presumably contracted in this manner. The patient should be placed in the prone position, the head low, on one side, and on no account to be raised; and in cases where bandages have to be applied to the chest, the shoulders only should be lifted. It is also advisable to subject the patient to as little movement as possible, in order to avoid vomiting. On returning the patient to bed, the pillows may be removed, and hot bottles, previously wrapped in flannel bags, placed alongside, as the bottles might otherwise injure the skin of the still unconscious patient. The case should then be carefully watched until signs of returning consciousness manifest themselves, and it is better to allow him to sleep off the effects of the anæsthetic, and the vigorous means sometimes resorted to for the purpose of rousing to consciousness should not be adopted. As a rule, no solid food should be allowed after an operation, although some patients appear to develop a keen appetite after an anæsthetic; but these cases are exceptional. It will be better to try a cup of tea or some other light refreshment to begin with, and thirst may be allayed by small quantities of an effervescent drink.

The two principal conditions we have to consider after a patient has been under the influence of an anæsthetic for a surgical operation are sickness and collapse from shock.

It is difficult to say precisely whether sickness is more common after chloroform or after ether. The more or less characteristic biliary vomit of ether inhalation is certainly not to be compared to the intractable sickness of some patients after chloroform. Sickness appears to be to a certain

extent idiosyncratic. It frequently occurs in patients whose general health is unsatisfactory, also in hospital patients who have been kept waiting for some time for their turn for operation. In this latter class he has found the administration of a stimulant of great service. However, if the foregoing directions have been carried out, he ventures to predict that vomiting, excepting in occasional instances, will be of very rare occurrence. For the alleviation and cure of this sometimes serious symptom an extensive array of remedies has been recommended with more or less satisfactory results.

Let the patient be as quiet and as comfortable as possible, also the above directions as to posture and manipulation carefully attended to. During the act of vomiting the patient should be drawn over onto the side and very diligently watched, for, apart from the possible regurgitation of fluids or other matters into the larynx, cases of syncope in this condition are not uncommon.

If there is a specific remedy for vomiting after an anæsthetic, it is chloroform, administered in doses of 2 to 5 minims on a piece of sugar or in a little water. Failing this, a draught of hot water, either alone or containing 10 grains of sodium bicarbonate, or a similar quantity of potassium bromide. It is essential that the water be hot, as tepid water rather tends to prolong sickness. Effervescing drinks, morsels of ice, iced champagne, iced coffee (but cold fluids must be given sparingly), and a sinapism applied over the epigastrium may be tried. In most cases the sickness disappears without special treatment, while some cases will defy all remedies.

As to drugs which have been specially recommended for this condition, he has found them very unsuccessful.

An enema of opium to which 30 grains of sodium bromide have been added is recommended for sickness after etherization.

Should the patient exhibit signs of collapse and respiratory failure, the tongue should be drawn out, and artificial respiration resorted to. The patient's head should be lowered, and a good-sized sinapism promptly applied to the præcordium; but the treatment of this alarming condition hardly comes within the scope of the present paper.

Finally, in operations requiring a brief anæsthesia in healthy persons, these elaborate measures may be for the most part dispensed with, the principal precaution being that the stomach be empty. These remarks also apply to the administration of nitrous oxide in dental operations, although this gas may be inhaled after food; yet if the patient happen to swallow any blood from a free hemorrhage, vomiting is usually inevitable.

A FEW OTOLOGICAL AND RHINOLOGICAL DON'TS; OR, WHAT NOT TO DO IN EAR AND NOSE CONDITIONS.

ROBERTS contributes the following brief notes to the *Medical Record* for June 1, 1895:

Don't advise or permit a patient with profuse otorrhœa to constantly wear cotton in the ear; it causes retention of discharge, and operates against that diligent attention to cleansing and other treatment which would otherwise be given.

Don't use the galvano-cautery in the auditory canal; it is liable to be followed by such consequences as necrosis, ulceration, otitis externa, or stenosis.

Don't blow insoluble powders into the ear, where there is a purulent discharge through a small perforation; it may appear to stop the discharge, but it does so usually by occluding the perforation, and may be followed by worse conditions.

Don't neglect to look for ear complications in all eruptive fevers, typhoid fever, diphtheria, and low types of pneumonia.

Don't Politzerize through nares in which there is stored up foul catarrhal mucus.

Don't Politzerize with much force in sensitive patients or those having a thin, translucent drum-membrane.

Don't neglect to keep watch of the mastoid prominence in all cases of purulent otitis, and if tenderness, heat, and swelling are found, to take measures to subdue a probable incipient mastoiditis.

Don't overlook, in chronic ear-disease, constitutional conditions, such as lithiasis, scorbutus, tuberculosis, and syphilis. This precaution applies likewise to diseases of the nose and throat.

In seeking to enlarge the capacity of the nasal passages, don't forget that in patients of middle age the tendency is towards atrophy, and don't think it necessary to secure an absolutely normal capacity on both sides at the expense of an entire turbinated body.

Don't spray the nose with powerful solutions, or only exceptionally with such as give pain.

Don't think that atrophic rhinitis or fetid catarrh can be helped by any medicinal applications until all inspissated crusts and dried mucus have been removed.

Don't use a douche arranged on the plan of the fountain syringe; it is pretty certain at some time to cause middle-ear inflammation.

Don't cauterize a turbinated body near a point lying in juxtaposition to the septum, or operate upon the turbinate and septum at one time. The result will probably be an adhesion, and the final state of that person will be worse than the first. In the case named the snare may be used, or a cautery may be applied to the central interior portion of the growth by the pointed electrode, or by injection of a few drops of dilute carbolic acid or pure iodine tincture.

Don't neglect to give especial attention to the posterior nares and vault of the pharynx; aside from operative measures, it is in these regions that local treatment will prove most effectual.

Don't make strong applications to the vault of the pharynx without guarding against the surplus fluid dropping into the larynx, and thus setting up an alarming attack of laryngeal spasm. This can best be avoided by pressing out the excess of fluid from the application and directing the patient to take a swallow of water immediately after the application is made; a very good plan also is to wind an extra wad of cotton around the shank of the applicator at about its bend, which will catch and hold any surplus fluid which may be pressed out by the palatal contraction.

Don't, under any circumstances, cauterize the pharynx above the level of the soft palate. As yet no one has succeeded in curing adhesions between the palate and wall of the pharynx.

Don't cauterize the septum; it will result in troublesome ulceration, or not unlikely in proliferation of tissue, producing exostosis or epichondrosis, according as it is either bony or cartilaginous tissue that has been offended.

Don't remove packing from the nose after an operation in less than thirty-six hours, or leave it in longer than sixty; the former action delays the progress of the case by causing irritation and renewed hemorrhage; the latter is needless and may result in some septic infection. Don't use any but antiseptic dressings, of which the best is iodoform gauze.

Don't prescribe cocaine preparations for coryza and tell your patient what you are giving; equally good results may be obtained by the use of hydrastinin nitrate in two- to four-per-cent. solutions or powders, and with more enduring effect, as well as without reaction.

Don't employ tannin or iron styptics, thereby producing tardy coagulation, difficult of removal; if anything short of plugging will suffice, it may be found in antipyrin forty-grain solution, or the pure drug, or in peroxide of hydrogen of about two-per-cent. volume.

THE TREATMENT OF CROUP BY CALOMEL SUBLIMATION.

FIRSTNIGHT, in writing on this topic in the *Archives of Pediatrics* for June, 1895, states that the treatment of laryngeal stenosis or obstruction in cases of croup by the sublimation of calomel was suggested some years ago by Dr. Corbin, of Brooklyn, and is hence sometimes designated as the Brooklyn treatment. It was permitted to lapse into disuse until Dr. Dillon Brown, of New York, again brought it into prominence. This method has in the writer's hands yielded markedly successful results. What are the indications for the employment of calomel sublimation? When in the course of a case of croup, whether it be looked upon as simple or specifically diphtheritic, the following symptoms appear, this method of treatment should be resorted to. As laryngeal stenosis increases, it will be observed that there is a recession of the suprasternal notch, a retraction of the infrathoracic walls, stridulous breathing, hoarseness of the voice, or aphonia at times, and lividity of the surface resulting from the deficient oxygenation of the blood. The presence of all or a major part of these symptoms should prompt us to employ this treatment.

The question has been asked, What is the rationale of this method of treatment? In reply it may be said that the remedy certainly does not act mechanically, that the drug may to some extent have a germicidal action, and that it is plausible, at least, to assume that the heated vapor may have a local effect similar to that produced by the vapor of slaking lime, which is sometimes used in the treatment of this condition. A better explanation than this the writer cannot offer, and he acknowledges that this method of treatment is empirical and not deductive. Nevertheless, favorable results are obtained in cases of this nature by this method of treatment, and, as that is the object to be obtained in the treatment of disease, we need not suffer any qualms of conscience because that treatment happens to be mainly empirical.

The medicine may be administered in doses ranging from 5 to 20 grains, repeated at intervals varying from one-half to two or three hours, according to the urgency of the symptoms. In the average case the proper dose is

15 grains, repeated hourly. He keeps the patient in the vapor-saturated atmosphere for a period varying from ten minutes to half an hour, always graduating the period in accordance with the gravity of the symptoms. The treatment is continued from one or two days to ten or twelve days, as indicated by the persistence of the laryngeal obstruction. In an extensive experience with cases of this description, which embraces more than one hundred patients subjected to this method of treatment, he has yet to meet the first case in which deleterious results have attended or followed it. In one case alone did ptyalism appear, and then only after the child had been subjected to the vapor for a prolonged period and just when it was about to be discontinued. The ptyalism was but slight, and very soon abated after stopping the treatment. The evil consequences which we must guard against are salivation, diarrhœa, and especially depression and prostration accompanied by anæmia. Knowing this, we can, by careful attention and alert watchfulness, prevent these untoward manifestations. The danger of prostration can be reduced by the administration of stimulants and nutrients during the progress of the treatment. It has been claimed that the kidneys become involved and that albuminuria supervenes. He has had no case presenting this complication.

In this connection it will not be amiss to allude to three women who were pregnant, and who, despite the author's protestations, would persist in getting under the tent with the child and inhaling the vapor of the subliming calomel. In each instance an abortion ensued. A woman who is pregnant should be restrained from exposing herself to the fumes of the drug, and the danger which she runs in so doing should be explained to her.

Should calomel sublimation be practised in cases which have been subjected to the operation of intubation? The writer answers most emphatically, Yes. Unhappily, many physicians seem to regard the operation of intubation as a curative measure. They do not stop to think that it is merely a palliative remedy, that it is the introduction of a rigid, non-collapsible artificial air-passage, for the purpose of granting the patient breathing capacity, and thus enabling him to outlive the disease. They seem to forget that the disease process is still active and in operation. As a consequence, all treatment is abandoned and the patient succumbs, bringing discredit upon the operation of intubation, because, forsooth, it did not cure the patient. In cases of intubation, calomel sublimation should be continued until the disappearance of the symptoms of laryngeal stenosis indicates to the physician that the treatment is no longer required.

What is the method of application of the remedy? The chief principle is that the vapor must not be dissipated throughout a large extent of atmosphere. The patients should be placed in an enclosure, with an apparatus adapted to the sublimation of the calomel. Such an enclosure can be constructed of a sheet, placed about the patient to resemble a tent. Apparatus for the sublimation of calomel can now be obtained at the apothecary and instrument shops. If such a one cannot be obtained, the ingenuity of any intelligent physician will suffice to devise some arrangement, always bearing in mind that both patient and vapor must be confined in a restricted atmospheric area.

The brilliant results obtained by the application of this remedy in cases of croup may seem well-nigh incredible to those unfamiliar with its use, but those who are familiar with the success attending this method of treatment can never be induced to discard so potent and efficacious a therapeutic measure.

NON-INFECTIOUS MEMBRANOUS LARYNGITIS, ETC.

Bedford Brown, after emphasizing his belief in the existence of diphtheritic and non-diphtheritic membranous laryngitis in the *Virginia Medical Monthly* for June, 1895, tells us of the treatment which he has used for years with success.

He regards the mercurial cathartic in membranous croup as our strongest and most valuable means of preventing membranous exudation. For forty-two years he has depended on it, and it has never failed him when given in time. He has never lost his early confidence in the power of mercury, and he still retains it. To accomplish good, it must be given with no timid hand, but boldly and fearlessly.

He divides ten grains of calomel, with a little soda (bicarb.) and sugar, into five powders after the emetic, and gives one of these every hour until they act copiously. He gives these doses to infants of twelve months. They generally act on the bowels three or four times copiously. If they do not, then repeated doses of castor oil are given for the purpose of producing free purgation. The subject of threatened croup is never debilitated by these cathartics, but grows progressively better under their influence. The mercurial seems to start the

secretions from every organ in the secretory list.

Purgatives he regards as of infinite importance for the prevention of exudation, whether in the trachea and larynx, the pleura, or the peritoneum. He believes them to be a potent means of diversion of action from the mucous membrane of the larynx and trachea to that of the intestines. After the free action of the primary mercurial cathartic, minute doses of the wine of ipecac every hour or two are continued until the character of the cough is changed by the free secretion of mucus. If after this the cough remains harsh, the following prescription is a useful one in promoting secretion:

℞ Liq. potass. citrat., f℥ss;
Syr. acac., f℥i;
Syr. senega, f℥ii;
Potass. iodid., ʒi;
Aquæ, ℥iss;
Potassii bicarbonate, ʒss. M.
Sig.—Teaspoonful every one or two hours.

This prophylactic treatment, if properly timed and executed faithfully, will rarely fail to prevent membranous croup.

Does medical treatment avail anything in croup after the exudation has taken place? The great majority of authors would answer this question in the negative. He has seen enough in the many cases which have come under his observation in the past to convince him that there is a certain percentage of recoveries after this stage. What proportion he does not state, probably larger than is usually supposed. He has, in a few instances, seen recoveries after expulsion of the entire membrane, and still more frequent after expulsion in detached portions.

Another important question is, whether there is any method of treatment or any particular class of remedies capable of promoting the separation and expulsion of the exudation. His experience in the treatment of this stage induces the writer to believe that certain agents tend to promote this object: remedies which stimulate mucous secretion from the inflamed mucosa underneath the exudation sufficient in quantity to detach the exudation and dislodge it from its attachments, and, again, remedies capable of exciting frequent and energetic cough. All who have witnessed cases of croup after the exudation has formed have observed the absolute suppression of cough. Cough, active, frequent, and forcible, is as important in membranous croup as in a case of bronchitis to dislodge every particle of membrane as rapidly as it may be detached. The remedies which he has found most capable of accomplishing these objects partake both of a local and general character.

In the first instance, the patient must be placed in a large, clean, airy room. Then a coal-oil or gas stove is placed near the bed, and on this a tin pail containing about a gallon of water. To this water is added oil of turpentine, one ounce; oil of eucalyptus, half an ounce; bicarbonate of sodium, one ounce. The water is maintained at the boiling-point continuously, night and day. Very soon the entire room becomes saturated with the moist exhalations, so that they are condensed on the glass of the windows. The object of this combination is twofold. The steam from the boiling water holding in solution the vegetable ingredients is for the purpose of exciting mucous secretion from underneath the exudation. The soda is for the purpose not only of disintegrating plastic exudation, but of exciting frequent cough, which it usually does. For purposes of disintegration he regards the soda as far superior to the lime. It certainly has acted more efficiently in the author's experience. In the case of a child three years old, with all the indications of membranous croup, with entire suppression of voice and cough, with very labored breathing, this arrangement, kept in constant and active operation, excited most harassing cough, with frequent expulsion of shreds and membrane, terminating in ultimate recovery. After exudation has taken place, the stage has passed for the use of cathartics, emetics, or eliminations. It then becomes a question of detachment of the exudation and expulsion by cough. Formerly, at this stage, he gave emetics for the purpose of expelling the membrane in every case. He can truly say that he has never seen the membrane expelled by an emetic; he never gives emetics for this purpose. But he has seen the exudation expelled by violent cough.

In his experience the two most potent alteratives we possess,—mercury and iodine,—as internal remedies, accomplish more in the stage of exudation than all others, and he gives them in the following combination:

℞ Aq. destil., ℥vii;
Potassii iodidi, ʒii;
Hydrarg. bichlor., gr i. M.
Sig.—Teaspoonful every hour.

Frequency in administering medicine in membranous croup is a question of vital importance. Whatever virtues mercury may possess in this disease, it is not due to any antiseptic influence. Those of us who gave mercury in the inflammatory diseases thirty or forty years ago,

and often witnessed its wonderful power over inflammation, are not prepared to admit that all of this therapeutic influence was due to antiseptic agency. There was something else besides that—an influence we termed alterative—which has never been explained, and for more than a century it was used in plastic exudative inflammations for its power in changing the morbid action in these cases, in preventing plastic exudation, and in modifying inflammatory action. For many years mercury suffered the condemnation of the profession, and went into, for a season, almost universal retirement; but it has been honorably recalled and again restored to a high position in our medical armamentarium for battling with disease.

Brown's experience in regard to nourishment induces him to give an exclusive milk diet to a patient with membranous croup. It possesses various advantages. It is nutritious, easily taken, and easily digested; and after many years of observation he believes it to be the best diet for patients while undergoing a course of mercurial treatment. He feels very certain that it modifies the deleterious action of mercury on the system. He is convinced that the milk-fed patient is, to some extent, rendered immune to the toxic action of mercury. This is true whether the child is nourished exclusively by the mother's milk or whether it subsists alone on cow's milk. It is almost impossible to produce in the exclusively milk-fed child those violent local and general toxic effects that we see in the adult. But so soon as the child ceases to subsist on milk, and changes his diet to a mixed animal and vegetable one, he becomes liable to the ill effects of mercury. An abundance of pure, rich, cold milk is the best of all forms of diet for the membranous croup patient while taking mercury. He is rendered less liable to the irritant action of mercury on the bowels and certainly less liable to salivation.

Mercurial fumigation, while offering some advantages in the local treatment of non-infectious membranous laryngitis, is more particularly adapted to the treatment of the infectious form. In the latter the full antiseptic and germicide properties of the drug are brought in contact with the infective germ, and in this way it becomes an essential element in the treatment of the diphtheritic forms of the disease. In the non-infectious form of membranous laryngitis the alterative action of the remedy is brought into play, and the stimulating influence is exerted on the mucosa of the larynx and trachea.

PRESCRIPTION FOR COLIC.

In the flatulent colic of infants—as, of course, a symptomatic treatment—the following gives excellent results:

℞ Extracti zingiberis fluid., ʃʒiss;
Tinct. asafœtidæ, ʃʒiii;
Aq. menth. pip.,
Aq. cinnamomi, of each, ʃ℥i;
Syrup. simplicis, ʃ℥iv. M.

Sig.—1 teaspoonful in water three times a day before meals.

—*Practitioner*, June, 1895.

A SUBSTITUTE FOR SULPHUR WATERS.

It is pointed out in *La Mèdecine Moderne* for June, 1895, that the natural sulphur waters do not keep well during transportation, and that, as a result of this, are not efficacious, except at their source, chiefly through the fact that the sulphur compounds are altered. At the same time the advantages to be obtained from the use of sulphur water are so great that it is worth while to attempt to produce a substitute, and it is thought that a solution of hyposulphite of sodium dissolved in glycerin and water is therapeutically active. An advantage in having the glycerin present in the solution is that it remains unaltered from several months to a year.

The following formula may be employed:

℞ Crystalline hyposulphite of sodium, ʒiiss;
Distilled water, ʒx;
Pure glycer n, ℥v.

The hyposulphite of sodium is to be dissolved in hot water and the glycerin added. A teaspoonful of this solution mixed with a quart of water charged with carbonic acid gas forms instantly an artificial sulphur water.

TREATMENT OF NERVOUS DEPRESSION.

The "pick-me-ups" of the druggist are commonly made up somewhat as follows:

℞ Potass. bromid., gr. xv;
Spirit. chlorof., ♏xx;
Tinct. gentian. co., ♏x;
Tinct. card. co, ♏x;
Spirit. amm. aromat., ♏x;
Elixir simpl., ʒss;
Aq. menth. pip., q. s. ad ℥i.

This is the kind of draught dispensed over the counter for the "head" produced by deficient exercise, or by overeating or drinking.—*Practitioner*, June, 1895.

TRANSFUSION OF BLOOD OR INFUSION OF SALT SOLUTION.

In an editorial in the *Boston Medical and Surgical Journal* for May 23, 1895, this subject is ably discussed, and it is stated that in an article under this heading in the *Münchener Medicinische Wochenschrift*, April 2, 1895, VON ZIEMSSEN calls attention to the fact that in spite of simplification of method, and in spite of the considerable number of cases which he had been able to report of the curative effect of repeated transfusions of blood in the same individual, the method of infusion of salt solution is given almost uniform preference in surgical practice, and blood transfusion is of little value in comparison. The reason for this is evident,—namely, that in the majority of the surgical and obstetrical emergencies in which either infusion or transfusion must be employed, the infusion of salt solution gives a simpler and more rapid means of restoring the lost bulk of fluid in the vessels, and is, therefore, far preferable to the more complicated operation of blood transfusion. On the other hand, the effect of salt infusion is at the best only transitory, and it becomes necessary, according to Von Ziemssen, in most cases to follow it sooner or later by an infusion of blood.

The indications for choosing one or the other method are usually plain. For instance, in the acute anæmia resulting from sudden and profuse hemorrhage, salt infusion is to be chosen. In anæmia resulting from disease of the blood-making organs, on the other hand, in which the percentage of hæmoglobin and the number of red blood-corpuscles falls even below that which results from sudden and profuse hemorrhage, no one would think of resorting to salt infusion. In simple anæmia resulting from profuse hemorrhage in a healthy patient, the restoration of the normal condition of the blood is immediately begun and carried on by the blood-making organs; in pernicious anæmia, etc., the blood making organs are so diseased as to be incapable of effecting repair of the blood-tissue.

In case of frequently repeated hemorrhage from internal organs, as in typhoid, ulcers of the stomach, etc., salt infusion, although it momentarily restores the heart's activity, leaves much to be desired on account of the fleeting nature of its effects.

It is in such cases as these that Von Ziemssen recommends transfusion of blood. He reports the case of a patient upon whom infusion of a litre of salt solution was performed, *ex indicatione vitale*, with marked temporary improvement. The operation was performed in the evening, and the following morning the patient's condition again became critical, and a loud systolic murmur appeared at the heart's apex. An arm-to-arm transfusion of one hundred and seventy-five cubic centimetres of blood was performed. Immediately after the operation the patient sank very low, but was revived by an injection of camphor, and the percentage of hæmoglobin was from thirty-two to forty per cent. on the following day. The anæmia was rather resistant to treatment, but finally yielded to subcutaneous injections of sodic arsenite, and in two months the patient left the hospital well.

In Von Ziemssen's opinion, the salt infusion in this case had an excellent but temporary effect, and without the transfusion which followed it, the result would have been fatal. He recommends that in all cases where the effect of salt infusion is temporary, it be followed by blood transfusion, and considers it questionable to wait more than twelve hours before resorting to this procedure. He finds that even during the operation the color of the skin and mucous membranes is improved, and that the subjective feeling of improved strength is quite marked for some hours after the operation; and he considers the good effects of the transfusion to be due as much to the fact that the blood-making organs are excited to activity as that the number of red blood-corpuscles is directly increased.

In our experience with infusion of salt solution, which has been chiefly confined to surgical cases, we have found that in a very large proportion of cases the effect, though always excellent, was but temporary, and that it was necessary, in order to render its effects permanent, to follow it up with copious and repeated enemata of salt solution and stimulants, or even to repeat the operation. In one case of hemorrhage from the ovarian artery following a laparotomy, in which the abdomen was reopened and the ovarian artery tied, the patient being enabled to bear the operation only by means of an intravenous infusion of salt solution which was performed at the same time, the effect of the infusion was marked, and the patient was put to bed with a better pulse than she had before the operation. Three hours later the symptoms of acute anæmia—absolute pallor, restlessness, and complete failure of the pulse—again returned, and infusion was repeated with the same result as before. The result was more permanent, however, the effect being kept up by copious and repeated rectal injections of salt solution, and the case pro-

gressed to recovery. Other cases might be cited in which the same treatment was successful. Whether the stimulating effect of a transfusion of blood upon the blood-making organs would have led to a better result it is difficult to say. At any rate, the same beneficial effect was noted in these cases from repeated salt infusion that Von Ziemssen found from his blood transfusion.

It is certainly true in these cases that in the first place the vascular system is depleted by the hemorrhage; then the tissues are emptied of serum taken up by the depleted vessels in order to enable the heart to act. The pressure in the vessels is so lowered by the hemorrhage that osmosis takes place from the lymph-spaces into the capillaries, so that the lymph-vessels as well as the blood-vessels are depleted. The bulk of salt solution given at the first infusion fills the blood-vessels temporarily, but is quickly taken up by the tissues, reducing the blood-pressure, and again reducing the volume of fluid with which the heart has to work, and causing the symptoms of acute anæmia to recur. The second infusion fills the vessels again, and the tissues, being already supplied with fluid, do not absorb it from them; hence equilibrium is restored and the effects of the second infusion are permanent.

If a sufficient amount of fluid is injected at the first operation, the second may be unnecessary; but it will always be a good rule to follow up an infusion by copious enemata of salt solution and, if necessary, to repeat the operation.

PRESCRIPTION FOR HEPATIC TORPOR.

The following is a favorite mixture for "sluggish liver and indigestion":

℞ Acid. nitro-hydrochlor. dil., ♏x;
Tinct. podophyllin, ♏x;
Succ. taraxaci, ʒi;
Tinct. nucis vom., ♏x;
Syrup. zingiberis, ʒss;
Aq. menth. pip., q. s. ad ℥ss.
Sig.—In water three times a day.

—*Practitioner*, June, 1895.

THE NATURE AND TREATMENT OF PERNICIOUS ANÆMIA.

A very interesting article, which has extended through several issues of the *British Medical Journal*, is one by STOCKWELL on this important topic, to which subject we have referred editorially on a number of occasions.

It has been stated and reiterated by nearly all writers that iron is of no value in pernicious anæmia. This is to a limited extent true, in so far that iron fails to cure or improve many patients, but such a way of stating the case is hardly correct. If a case is curable at all (excluding those which are necessarily fatal), then iron is bound to be of value, as it is of value whenever a deficiency of hæmoglobin has to be made good. The iron of the hæmoglobin must be obtained from somewhere, and if a patient once begins to pick up, and the number of red corpuscles to increase, the iron in the liver and elsewhere will soon be used up, and the metal has to be supplied by the food, re-enforced by a further supply in the usual pharmaceutical forms. The reason why iron so often fails to cure anæmia is simply that, owing to the numerous hemorrhages, blood manufacture does not keep pace with blood loss. For the same reason iron is apparently quite useless in the anæmia of scurvy or purpura so long as the bleedings continue.

Quincke treated his seven cases of recovery with iron, and Wilks and Finlay both record cases in which arsenic failed to effect any improvement, and iron was afterwards successful.

It is always advisable, therefore, to give iron. It is often, however, very badly borne by the stomach, and has frequently to be cautiously given in small doses of non-irritating preparations. Often it agrees well enough in large doses. Non-irritating preparations (ferrum tartaratum, ferri et ammonii citras) may be given per rectum, and act efficaciously enough if iron cannot be taken by the mouth.

Arsenic was first strongly recommended in anæmic conditions by Isnard (1865), but its value in pernicious anæmia was first drawn attention to by Dr. Bramwell. Since then it has been largely used, and a number of cases of recovery from "pernicious anæmia" have been recorded after its administration. Broadbent found phosphorus valuable in two cases, and Gowers, in two cases of lymphadenoma with anæmia, found it to increase the number of corpuscles. On the other hand, phosphorus has frequently proved ineffective (Bradbury, Eichhorst, and others), and it has never attained the reputation of arsenic. The mode of action of both is little understood, but neither of them can replace iron in the blood-corpuscles, and hence, as they both have a powerfully stimulant and alterative effect on bone, it is probably not far from correct to assume that they may stimulate the bone-marrow and thus increase the number of blood-corpuscles produced by it. We have no definite knowledge on this point, however.

Arsenic has undoubtedly started many cases towards recovery by increasing the number of red corpuscles, but it cannot supply their most necessary constituent, and hence after the increase has begun it seems advisable to use iron to help in maintaining the improvement. Too often it seems to simply stimulate the exhausted bone-marrow into a last display of activity, and the temporary improvement is followed by a relapse and death. Many cases of this temporary improvement have been recorded (Pye-Smith, Barrs, and others). Fürbringer states that of fifty-three cases treated by himself with arsenic, twenty seven died, sixteen had improved, and ten remained *in statu quo*,—not a very brilliant record.

It is probable that at the present time too much reliance is placed on arsenic; it has come to be looked upon as a specific in "pernicious anæmia," acting in some mysterious recondite way, and is used in a routine fashion to the exclusion of therapeutic measures based, so far as possible, on etiological considerations. Of its good effect in some cases there can, however, be no reasonable doubt.

Stockwell has had little experience of transfusion; 3 to 6 ounces of defibrinated blood seems to have been the amount generally used by others. Frequently it produces some slight temporary improvement, in a very few cases permanent benefit has followed, and in many it is reported to have caused considerable systemic disturbance, with albuminuria and hæmaturia. Some authors have recorded a fatal issue almost immediately after. Theoretically, if one wishes to give blood, it seems that frequently repeated subcutaneous injections of defibrinated human blood (as used by Von Ziemssen and Silbermann) would be the most efficacious and least dangerous method of administration, but a sufficient supply would be difficult to obtain. One cannot use the blood of animals, as, whether given by a vein or subcutaneously, it tends to cause dangerous systemic disturbance to a much greater extent than human blood.

Both experience and theory are, on the whole, against transfusion of blood in chronic anæmia. If it be given under the idea of supplying iron in the form of hæmoglobin, it is a cumbersome and bulky way of giving a very small quantity, with some risk of sepsis and other dangerous complications. The serum is in this case a useless addition. If it be given under the idea of supplying red corpuscles, the number is again very small, and at best they only survive for a few weeks or less. In this case, however, it may help to tide over threatened death from anæmia and give time for other measures to be carried out. There is no evidence in favor of the statement made by some that the serum acts as an antitoxin, antagonizing a supposititious toxin which is destroying the blood-corpuscles. Professor T. R. Fraser has reported a case of pernicious anæmia treated with three ounces of ox and calf bone-marrow daily. Iron, and subsequently arsenic and salol, were also given, but under these no improvement took place until the bone-marrow was administered in addition. Dr. A. G. Barrs has also published a case in which arsenic had failed to effect any improvement, and in which he then administered bone-marrow without any other drug. Complete recovery took place in about two months.

Owing to the kindness of Dr. John Wyllie, the writer has had the opportunity of studying the effects of bone-marrow in a case under his care in the Royal Infirmary. The patient was a woman, aged forty-one, with a history of some degree of menorrhagia and a very doubtful history of melæna, but the cause of the extreme anæmia was never satisfactorily determined. On admission the corpuscles numbered one million four hundred thousand per cubic millimetre and the hæmoglobin was twenty per cent. of the normal. Under treatment with iron and arsenic these improved to one million seven hundred thousand and the hæmoglobin to thirty per cent., but she then ceased to progress. Bone-marrow, 1½ ounces daily, was given, without any other treatment, except careful dieting, and in eighteen days the corpuscles had fallen to one million two hundred thousand and the hæmoglobin to fifteen per cent. The bone-marrow disagreed with her stomach, owing to its being so fat, and a larger quantity could not be borne. She died afterwards, but an examination was not obtained.

It is difficult to account for the good results obtained by Drs. Fraser and Barrs, if recovery were really due to the bone-marrow and not to the other treatment. Stockwell has examined the marrow as supplied in the Royal Infirmary and in the Leeds Infirmary, and found it to consist of yellow marrow, which is not a hæmatopoietic tissue like red bone-marrow, but is entirely fat, with a little connective tissue. The amount of iron present in it was also determined in three specimens from different animals, with the following results: 26 grains contained .001 grain Fe, 20 grains contained slightly under this amount, and 100 grains contained .0025 grain Fe. That is to say, 1 ounce of bone-marrow contains about $\frac{1}{8}\frac{1}{0}$ grain of iron or less. He has also examined the amount of iron present in red bone-marrow from the calf:

40 grains contained only .0035 Fe, while 26 grains contained .002 Fe, equal only to about $\frac{1}{20}$ grain of iron per ounce. The butchers informed the writer that a calf only yields about three or four ounces of such marrow, and that a large supply would be very difficult to obtain. Clearly it cannot be the iron which is beneficial, if benefit does result.

ETHER FOR ANÆSTHESIA IN MUNICH.

P. ZIEGLER (*Münchener Medicinische Wochenschrift*, 1895, No. 23) says ether has been used at the surgical clinic in Munich since May 1, 1893. The experience in six hundred cases is now made public. . . . In conclusion, the unpleasant sensation of suffocating at the beginning, the cyanosis, the excessive secretion of mucus and saliva, the tardy relaxation so common in alcoholics, the frequent partial return to consciousness when the cone is removed, are annoying, but can be obviated by greater experience. Over against these is the diminished danger, since cardiac syncope is not primary, but secondary to respiratory syncope, which can be more easily overcome. Ether is not recommended for operations on the face, and is directly contraindicated in all diseases of the air-passages, including compression of the trachea. He declares himself in favor of the use of ether, and the latest statistics justify him, for one death has resulted in nineteen hundred cases of chloroform anæsthesia, while with ether one death in twenty-six thousand cases.—*Centralblatt für Gynäkologie; Journal of the American Medical Association*, May 11, 1895.

TREATMENT OF NON-OPERATIVE UTERINE CANCER.

In the treatment of this condition there are four principal indications to be fulfilled: first, to aid in the escape of morbid products; second, to overcome the fetor by maintaining rigid asepsis; third, to arrest hemorrhage; and, fourth, to relieve the pain. In aiding in the removal of the morbid tissue we may resort to the caustics and the curette, the latter being by far the better of the two methods, a sinus speculum being employed. Should the body of the uterus be the part affected, the cervix must be gradually dilated by tents or sounds and the diseased tissues curetted away, the vagina being well tamponed with iodoform gauze.

If caustics are used, the chloride of zinc is the best, and it may be employed by soaking small cotton tampons in the following:

Chloride of zinc, ½ ounce;
Distilled water, 1 ounce.

These tampons should be applied to the affected part. If this method is used, the vaginal walls should be protected by the following salve:

Bicarbonate of sodium, 2½ drachms;
Lard, 10 drachms.

In other cases it is sufficient to insert a vaginal tampon of cotton soaked in sodium bicarbonate solution. After the chloride of zinc tampon has been in place four hours, it is removed, and a vaginal injection of mercury bichloride (1 to 1000) is used. Guichard has used parenchymatous injections of zinc chloride, in the strength of 1 to 5, in cases of cancer, injecting the drug into the morbid tissues. Another method closely allied to this is to inject absolute alcohol by means of a small syringe into the diseased part, repeating it every day until five or six injections have been given; this is used in cancer of the cervix.—LUTAUD, *Maladies des Femmes*.

THE TREATMENT OF CARDIAC DISEASE IN CHILDREN.

The following rules are given by PERRIER as to the management of this condition. In the first place, the child should be protected from cold, both because it depresses vitality and also because cold may cause internal congestions. Much fatigue is to be avoided and violent exercise forbidden. In the case of girls, particular attention is to be paid to these points at the approach of puberty. Secondly, the greatest care should be exercised as to diet, which should be simple, and consist largely of milk, eggs, easily digested soups, and tender, plainly cooked meats. Milk should be the drink for each meal. Thirdly, a life in the open air is very essential, and the climate should be changed by resorting to warm places in winter and cool ones in summer, for all persons with cardiac disease, particularly children, suffer from rapid changes in temperature. Cold sponging followed by dry rubbing is also of value. In the way of tonic treatment, one of the following prescriptions may be used alternately every five days.

Fowler's solution, 4 drachms.
Sig.—1 drop *t. i. d.*

And

Tincture of gentian, 1 ounce.
Sig.—1 teaspoonful *t. i. d.*

Often, too, a small glassful of malt extract is of service after meals.

Should there be much cardiac excitability, the following may be used in the dose of a teaspoonful twice a day:

Bromide of calcium, 2½ drachms.
Syrup of bitter orange, 4 ounces.

Should there be a tendency to constipation, a little magnesia may be given once or twice a week.

Where there is well-marked rupture of compensation and the muscle is feeble, an absolute milk diet with rest in bed is advisable, the food being given at frequent intervals in small doses and diluted, if the urine is scanty, with lactose in water or by some alkaline water, such as Sels. Every two hours between the doses of food the following may be used with advantage:

℞ Tincture of digitalis, 5 to 10 drops;
Tincture of cinchona, 7 drachms;
Syrup of orange, 3 ounces.
A teaspoonful about half an hour after eating.

Every morning, to avoid straining, an enema may be given to move the bowels and to favor diuresis. Once in every two weeks a small blister may be placed over the heart with advantage.

Where the rupture of compensation has lasted for some time, the following may be ordered:

Caffeine, 4 to 7 grains;
Benzoate of sodium, 15 to 30 grains;
Syrup, 5 drachms;
Peppermint-water, 3 ounces.
Dessertspoonful *t. i. d.* for a child of from seven to twelve years.

Should there be cyanosis, it may be wise to use

Extract of convallaria majalis, 8 grains;
Syrup, 1 ounce;
Infusion of cinchona, 3 ounces.

A warm rectal infection should be ordered night and morning, and every eight or ten days a small blister applied to the præcordium. If there is a tendency to dropsy, hot-air baths may be used with caution, and if sudden cardiac oppression comes on, hypodermic injections of ether are to be employed.—*Maladies des Enfants.*

TREATMENT OF SEXUAL TORPOR IN THE FEMALE.

In *Maladies des Femmes*, LUTAUD states that the physician is often consulted because of lack of sexual appetite in woman, and that after inquiry as to the general health his attention should be given to the sexual functions in order to discover any abnormality or functional disorder. A useful recipe in some cases is

Extract of nux vomica,
Extract of cannabis indica, of each, 15 grains;
Aqueous extract of aloes, 3 grains.
M. ft. in pil. no. 50.
One after each meal.

In other instances phosphorus is better.

Phosphorus, ½ grain;
Bisulphide of carbon, 20 drops;
Oil of almonds, 5 drachms;
Magnesia, q. s.
M. ft. in pil. no. 50.

These pills should be gelatin coated, and one may be taken after each meal.

Musk, vanilla, and santal all have the reputation of being aphrodisiacs, and small doses of cantharides are often useful.

Powdered vanilla,
Powdered canella, of each, 45 grains;
Powdered mace, 15 grains;
Powdered black pepper,
Powdered nux vomica, of each, 5 grains;
Powdered carbonate of iron, 4 grains.
M. ft. in cachet no. 10.
One after meals.

Sometimes minute doses of opium taken at night before retiring may prove useful; in other cases cocaine is of value, but the fear of contracting the habit of using these drugs is to be recollected.

TREATMENT OF ASTHMA IN CHILDREN.

In an attack of asthma place the patient near an open window, without putting him in a draught, apply hot poultices with mustard in them to the extremities, and prepare fumigations by burning datura or nitre-papers, or by placing a few drops of pyridine upon a warm plate. In other cases relief is afforded by pouring a few drops of ether or chloroform on a handkerchief, which is held near the nose. Often much relief can be obtained by keeping water boiling in the room by means of an alcohol lamp. In the boiling water may be placed a few eucalyptus leaves or a few drops of oil of eucalyptus. The following mixture may also be given every quarter-hour in the dose of a dessertspoonful:

Tincture of belladonna, 5 to 10 drops;
Tincture of grindelia, 10 to 20 drops;
Tincture of lobelia, 20 to 30 drops;
Ether, 2 to 4 drachms;
Syrup of orange, 4 drachms;
Water, 3 ounces.

When the attack is very persistent, moderate doses of antipyrin sometimes gives relief.

Should acute bronchitis or pulmonary congestion supervene, the chest should be enveloped in a mustard plaster, the fumigations or inhalations already named be ordered, and a teaspoonful of the following given every fifteen minutes:

Tincture of belladonna, 5 to 10 drops;
Syrup of ipecac, 2 drachms;
Syrup of orange, 1 ounce;
Codeine, 2 grains;
Ether, 1 drachm;
Water of orange flowers, 2 ounces.

Between the attacks the following will prove useful:

Potassium iodide, 1 to 2 drachms;
Syrup of Tolu, 6 ounces;
Syrup of orange, 6 ounces.
A teaspoonful after meals.

The bowels should be kept moved by some gentle laxative, the food should be very simple, the body should be rubbed daily with a coarse towel or bathing glove, exercise in the open air is to be insisted on, and, if possible, a mountain climate is to be sought.—PERRIER, in *Maladies des Enfants*.

A NOVEL METHOD OF ASSISTING UTERINE INERTIA.

Possessed of a somewhat extensive midwifery practice, and having by repeated experience learned the advisability of having the bowels thoroughly well cleansed, for the comfort of both patient and accoucheur, it has been the writer's custom to carry a large bottle of Parke, Davis & Co.'s glycerin suppositories. One day he was called in a hurry to attend a young woman with her first-born. Not having been previously engaged for the case, he found, upon arrival, that the necessary preparations had been overlooked. After the usual cautions an examination was made, which displayed the os uteri well dilated, membranes unruptured, parts small, and pains of a very weak nature, with long intervals between. Upon inquiry, it was learned that she had been in labor about twelve hours, but it had not been considered necessary to send for a physician, the pains being so very weak. Thinking a long and tedious case lay before him, Cowen adopted his usual routine practice of placing a glycerin suppository in the rectum. It had not been long *in situ* when the patient implored him to remove the "horrid thing," as it caused very severe pain. Presently, to the writer's surprise, he discovered that the pains were those of labor, the intervals being quickly shortened.

After eight or ten strong pains, a second examination revealed little or no progress of the head, and, at the persistent and repeated requests of the patient, he removed the suppository,—that is, what remained of it. Immediately the pains ceased and the intervals again became lengthened. After waiting for an hour or more, it suddenly occurred to the writer that the glycerin suppository previously placed must have acted otherwise than expected,—that, in fact, it might have stimulated the uterus to activity. Anxious to determine if such were the fact, he reintroduced a suppository in the rectum, assuring the woman that this time it must remain. As a result, increased uterine contractions with hard labor-pains returned. Frequent examinations were made between each pain. Quickly the head advanced, and when it was well down upon the perineum, the latter being very rigid, the patient was placed upon her left side ready for delivery. Supporting the perineum, the head was shortly born, but at the same moment the remaining undissolved portion of the glycerin suppository fell out.

Before making known the above, Cowen experimented upon twelve cases, the notes of which he has in his possession, and in all these he conclusively proved the efficacy of glycerin suppositories in such cases, and now would not feel at all armed without them.

In conclusion, the writer will be pleased to hear from any other practitioner upon the subject, as well as gratified to learn that others have had similar results.—DR. COWEN, in the *Medical Age*, August 10, 1895.

TREATMENT OF ACUTE BRONCHITIS OF INFANCY.

PERRIER, in *Maladies des Enfants*, directs that in the very acute forms of bronchitis in children the chest should be rubbed with oil; warm drinks should be given, particularly hot milk. Sometimes, if there is much oppression, it is well to apply a thin and light but mild mustard plaster. If the stomach is loaded with partially digested food, an emetic of powdered ipecac, 1 to 2 grains, and syrup of ipecac, 1 ounce, may be given, in the dose of a teaspoonful every ten minutes till the desired effect is produced, and if the fever is high, 1

or 2 grains of the hydrochlorate of quinine may be given in a little coffee. The air of the room should be moderately warm and moist, but it is most important that the ventilation be good.

As the disease progresses, if bronchial secretion becomes very profuse, the following prescription may be used:

Oxide of antimony, ½ grain;
Syrup of senega, 1 ounce;
Syrup of acacia, 2 ounces. M.
Sig.—A teaspoonful every two hours.

Or this may be replaced by

Terpine hydrate, 2 to 4 grains;
Brandy, 2 drachms;
Syrup of cinchona, ½ ounce;
Syrup of orange, 2 ounces.
Sig.—A teaspoonful every two hours.

Often an emetic will aid in relieving the lungs of mucus. During the day a little additional brandy or red wine may be given as a stimulant.

In those cases in which frequent attacks of bronchitis follow one another it is useful to give the child warm baths, followed by cold sponging, and this, in turn, by active friction of the skin in drying the body. Malt extracts should be given with each meal, and a teaspoonful of the following prescription ordered three times a day:

Arsenate of sodium, 1 grain;
Distilled water, 6 ounces. M.
Sig.—A teaspoonful after meals.

If, notwithstanding these measures, the child fails to improve, it must be taken to a dry climate, which should be neither too hot nor too cold.

THE TREATMENT OF IRITIS.

In the *Clinical Journal* for September 4, 1895, in a lecture, TWEEDY states that if you are satisfied that the iris is inflamed, whatever else there may be, you must endeavor by early and energetic treatment to prevent the formation of adhesions of the iris to the capsule of the lens. In the management of all inflammatory affections of the eye, remember that the two chief factors in the healthy nutrition of the eyes are, first, the integrity of the ciliary body, and, second, patency of the angle of the anterior chamber. Neither of these conditions can be insured if posterior synechia occur.

The ciliary body is the chief nutritive organ of the eye. It secretes and elaborates the fluids which nourish the vitreous, the lens, and the posterior layers of the cornea, and if it be implicated by disease, the nutrition of these dependent structures must suffer more or less. The fluids which are secreted by the ciliary body ultimately pass forward into the posterior chamber of the eye through the pupil into the anterior chamber, whence they make their way through the delicate lymphatic meshes (spaces of Fontana) situated at the angle of the anterior chamber, between the iris and the cornea. This lymphatic system communicates with the canal of Schlemm, which, in its turn, is in communication with the anterior ciliary veins. The angle of the anterior chamber, therefore, is the drainage system of, at least, the anterior segment of the eye. Now, if this angle be obliterated either by apposition or adhesion of the iris to the cornea, or by being occupied by inflammatory exudation, the conditions of healthy nutrition are destroyed. If the ciliary body continue to secrete its nutritive fluids, accumulation must take place if elimination be in any great degree checked. The vitreous humor will become surcharged with fluids and the eyeball becomes hard (glaucomatous). Meanwhile, the proper elements of the vitreous tissue are pressed upon, and if there be, in addition, any admixture of inflammatory exudation, the vitreous becomes more or less hazy, and may ultimately undergo shrinkage and give rise to detachment of the retina.

One can readily understand how these contingencies may arise in every case of untreated or ill-treated iritis. The ciliary body, being in direct textural continuity with the iris, is, therefore, prone to participate in iritis. On the other hand, adhesions may occur between the base of the iris and the posterior layer of the cornea, thereby obliterating the angle of the anterior chamber and inducing the anatomical basis of glaucoma. The formation of posterior synechia may bring about similar results by destroying the communication between the posterior and anterior chambers of the eye; for if this communication be stopped, fluid accumulates behind the iris, pushing it forward, and giving rise to what is called a "ballooned" iris, or iris *bombé*, which, in its turn, may lead to closure of the angle of the anterior chamber and subsequent glaucoma.

Having diagnosed iritis, how shall we proceed? In the treatment of iritis we must follow not only the general indications, but also and more particularly the special ones. The *general* indications are to relieve pain and other urgent symptoms, to arrest the morbid processes, to treat and, as far as practicable, remove all constitutional and local causes, and to endeavor to bring about recovery as quickly,

pleasantly, and safely as possible. The *special* indications are to obtain dilatation of the pupil, in order to prevent the formation of adhesions of the iris to the capsule of the lens, or to break down any adhesions that may have formed; to preserve, if possible, the integrity of the ciliary body and to maintain the efficiency of the drainage apparatus at the angle of the anterior chamber. The special indications are always the most urgent and most imperative. General remedies are valuable auxiliaries in the treatment of iritis and should not be neglected, but they are of little avail unless local measures are intelligently and skilfully employed.

The first thing to be done is to get the pupil dilated as quickly and as fully as possible. For this purpose it is usual to employ a solution of sulphate of atropine, of the strength of about four grains to the ounce. Many other substances, such as duboisine, hyoscin, hyoscyamin, do as well as atropine, and are sometimes to be preferred. Atropine and most of the other mydriatics are beneficial in iritis in many ways: they dilate the pupil, and thereby prevent or break down adhesions; they empty the engorged vessels of the inflamed iris, and by this means, as well as in other ways, control the inflammatory process; they relieve pain, and they keep the iris and the ciliary body at rest, as splints keep a broken bone or an inflamed joint at rest, and thereby facilitate repair. In a recent case of iritis a drop of atropine should be applied to the inside of the lower lids every quarter of an hour for about two hours, and then about once every three or four hours, until the pupil is well dilated. If the pupil dilate moderately and circularly after a few applications, the intervals should be prolonged, and the atropine used only often enough to maintain the dilatation. If no adhesions have formed, or if the adhesions be few and fragile, the pupil will soon dilate; but if the adhesions are many and strong, many hours, and even days, may elapse before appreciable dilatation takes place. Do not, therefore, be discouraged and discontinue the atropine because dilatation does not occur at once. In many cases the adhesions only give way during the processes of resolution and repair, but they will not give way even then unless the iris be kept under the influence of atropine.

Can we assist the action of atropine? Yes. In the earlier stages of acute iritis the free use of hot fomentations, or vapor, or dry heat, the application of two or three leeches to the inner angle of the lids, or of Heurteloup's artificial leech to the temple, or a free purge will sometimes assist the action of the atropine. In the later stages, mercurial inunction into the brow and temples and small doses of mercury internally often act similarly.

How long should atropine be used? The rule I generally follow is to use it until all the external redness has disappeared, and from ten days to a fortnight after. If it be stopped too soon, there is a risk of relapse or early recurrence.

Unfortunately, cases occasionally arise in which atropine is not tolerated. In some cases intense local inflammation of the lids sometimes occurs when atropine is applied. In such the lids should be washed two or three times a day with a warmed saturated solution of boric acid, or a weak solution of alum, or sulphate of zinc, or (if there be no corneal abrasion) of lead. Hyoscin, or duboisine, or some other mydriatic should be substituted for the atropine. More rarely another and more troublesome form of intolerance to atropine is manifested. In the woman you have just seen with chronic iritis, three or four applications of the atropine produced great and persistent delirium. In such a case the only practicable course is to discontinue the atropine, and when the iritis has run its course to perform an early iridectomy if there be many adhesions.

Another difficulty sometimes arises in iritis. Occasionally, when the eye is first seen, or, more rarely, in the course of the disease, the tension of the eyeball is appreciably increased. We have, then, to decide whether the case is one of genuine glaucoma, or whether the hardness is only an accidental and transient phase of iritis. I would say that if there be clear evidence that the case was primarily simple iritis, and that the increased tension is an intercurrent symptom apparently dependent upon the presence of posterior synechia, atropine should be used in spite of the hardness of the globe, though it should be used cautiously and the eye kept under observation. In most cases the hardness will subside when the atropine has acted, either by breaking down some of the posterior synechiæ or in some other way relieving the inflammation. It is, I believe, a harmful procedure to use eserine or other myotic in such cases. Eserine is, of course, of great service in reducing the hardness of the eyeball of true glaucoma; but it is often worse than useless when employed to relieve the hardness occurring in the course of primary inflammation of the iris.

If in iritis increased tension persist, in spite of the use of atropine and other antiphlogistic

measures, the anterior chamber should be tapped by means of a broad needle or a narrow knife inserted at the corneo-scleral margin. Paracentesis is especially indicated if the anterior chamber be deep, as in serous iritis, and if the aqueous humor be turbid. Letting out the inflammatory fluids often initiates resolution here, as it does in pleurisy, peritonitis, and other inflammations of serous sacs.

If high tension persist, in spite of treatment and in spite of paracentesis, an iridectomy should be done, though this operation should not be performed during the acute stages of inflammation, unless the indications be very urgent. On the other hand, if, as the result of the inflammation, the pupil is covered with lymph and the ring of the iris is adherent to the capsule of the lens, as in the old man you have just seen, the operation of iridectomy is required, not only to restore vision, but also to prevent the deteriorating effects of total posterior synechia upon the vitreous and the lens, as well as to lessen the risks of recurrent inflammation.

Tweedy has dealt with the local treatment of iritis, but one must not infer that the treatment in all cases should be purely local. Local treatment is indispensable, but, as he has already stated, general remedies must be employed according to the special indications of each particular case, in accordance with the recognized principles and practice of general medicine and surgery.

SERO-THERAPEUTIC TREATMENT OF CANCER.

RICHET and HERICOURT (*Presse Méd.*, May 4, 1895) communicated to the Académie des Sciences, April 29, 1895, details of two cases of malignant growths in which they applied the serum treatment. The serum employed was obtained from the blood of an ass and two dogs, into which the authors had injected the liquid expressed from an osteo-sarcoma of the leg removed by Reclus. The first case was a fibro-sarcoma about the size of an orange. It was removed in October, 1894, by Terrier, and reappeared about the size of a small nut in February, 1895. By the middle of March, when the injections were commenced, it had attained the size of a small orange. The injections were made into the cellular tissue round about the tumor, 3 cubic centimetres for each injection daily, and were continued during forty days, representing a total dose of 120 cubic centimetres.

By March 26 the tumor was manifestly smaller, and progressively diminished until, at the conclusion of the treatment, it was reduced to a small indurated plaque. The general condition of the patient had also improved.

The second case was one of cancer of the stomach, showing itself by a tumor as large as an orange in the epigastric region of a man forty-four years of age.

The treatment was commenced on April 6, 1895, by the injection of 4 cubic centimetres of serum. From this date until the 24th of the same month the relatively considerable dose of 64 cubic centimetres was injected. An amelioration in the general condition of the patient immediately took place. His weight increased from fifty-seven kilogrammes on April 10 to sixty kilogrammes on the 23d of that month.

On April 10 also the tumor had diminished in volume, and this diminution was so rapid that on April 20 there was no longer felt any isolated, prominent growth. Palpation of the epigastric region only gave the impression of a vague, deep, resistant spot, difficult to define. —*British Medical Journal*, June 1, 1895.

THE MECHANICAL TREATMENT OF HEADACHE.

We are told by *La Médecine Moderne* for June, 1895, that BUM, of Vienna, recommends strongly the following treatment, having employed it in seventeen cases.

The treatment lasts from five weeks to several months, and consists in tapping, friction, and other methods of massage applied to the scalp and entire head. As the patient becomes accustomed to the treatment the tapping is made quite forcible. The author states that by this treatment useful changes in the circulation and in the absorption processes take place in the muscles and nerves of the scalp.

FLAT-FOOT: ITS CORRECTION AND COMPARATIVE STUDY.

In an elaborate study of this subject, RICKETTS has arrived at the following conclusions:

1. That flat-foot is principally due to one of three causes,—(*a*) failure of the tarsus to become arched, (*b*) rickets, and (*c*) trauma.

2. That it becomes aggravated with age.

3. That all bipeds are born flat-footed, the arch being an after-consideration.

4. That the highest arches are found in the fleetest runners.

5. That the barefooted races do not have any very perceptible arch, but do not seem to suffer any inconvenience on this account.

6. That man's nearest allies—the chimpanzee, gorilla, orang, and baboon—have but little indication of an arch. On the other hand, the tarsus in the chimpanzee, his nearest ally, lies upon the plane, while the posterior under surface of the os calcis does not touch the plane to any degree whatever. In the gorilla, however, the posterior part of the os calcis, together with the tips of the toes, support the body, the tarsus not touching the plane. This is the case with the orang.

7. That the construction of the hands and feet of the quadrumana is of the same pattern as those of man, but they are not so symmetrical or so well adapted for diversified use.

8. That the manner of dressing the foot in early life is a prominent factor in causing pain and discomfort in feet that are disposed to flatness.

9. That the degree of the arch of the foot increases with civilization.

10. That but little benefit can be derived from any kind of an appliance, except in the lesser degrees of deformity.

11. That the aggravated forms of flat-floot should be subjected to the operation of Trendelenburg or of Gleich, regardless of what the cause may be.

12. That, so far as can be determined by observation, the relief given by the Trendelenburg operation has been absolute.

13. That, all things being equal from a cosmetic point of view, the operation of Gleich (dropping the posterior half of the os calcis) would be the most desirable. Nothing but time and the making of a number of operations by each method will determine their relative merits.

14. That in all cases of Pott's fracture, where flat-foot has previously existed, a cure has always resulted.

15. That, if the osteotomies are made subperiosteally and aseptically, without complications, no serious results should follow.

16. That the first plaster-of-Paris dressing, which has been fenestrated and re-enforced by small ribs of steel, should be removed at the end of the tenth or twelfth day and a new one adjusted to make sure that abduction is of the proper degree.

17. That his own experience would lead him to operate unhesitatingly upon any flat-foot, causing incapacity by pain or deformity, which could not be relieved by mechanical devices.

18. That the operation in the case just reported resulted in all that could be asked for, making a producer out of a consumer.

THE TREATMENT OF SPINA BIFIDA BY PLASTIC OPERATION.

In an article under the above title, ROBSON states (*Annals of Surgery*, vol. xxii., No. 1, 1895) that a larger experience has confirmed the views which he enunciated before the London Clinical Society in March, 1895, that a majority of the cases were instances of meningocele rather than of myelocele, and therefore more amenable to radical treatment. The use of Morton's fluid is not recommended, on account of the danger attending its use. A number of cases are known to have died on the table while being subjected to this operation, while others have succumbed to a rapidly developing hydrocephalus. The author states that a continued experience leads him to say that nearly all cases calling for interference may be treated by excision of the whole or part of the sac, or by some modification of this, with a great probability of success. The author has operated on twenty cases by this method, with but four deaths. For practical purposes, it is convenient to divide all cases of spina bifida into three classes:

1. Those where an operation is not necessary, as in cases where the sac is small and well covered by a firm pad of the integuments.

2. Those where operation is not advisable, as in fissure of the whole or a considerable part of the spinal column, or where there is well-marked hydrocephalus or paraplegia.

3. Those in which operation is indicated, as,—

(*a*) In meningocele, whether the opening in the spinal canal be large or small; in the one case meningeal, separate from integumental, flaps being formed; in the other, the pedicle of the meningocele being ligatured and the subcutaneous tissues and skin brought together over this by separate sutures.

(*b*) In cases where the coverings are thin and translucent, even when this condition extends to the margin of the tumor, operation is advisable, as by rendering aseptic the thin covering, it may be partly utilized, if required, to form the meningeal flaps, when the adjoining skin can be undermined and made to slide over the new meninges.

(*c*) In cases where the cord is expanded or nerves are blended with the sac, excision of redundant parts or incision between manifest portions of nervous structures reduce the tumor and enable it to be placed in the canal,

and usually there is no difficulty in covering the replaced structures.

It is of the utmost importance to render the parts aseptic as a preliminary to operation, and to observe the strictest antiseptic precautions at the time of operation and subsequently.

In most cases a silver or celluloid shield should be worn for a time after healing is completed, in order to protect the cicatrix and to prevent it from bulging.

LAPAROTOMY FOR PENETRATING WOUNDS OF THE ABDOMEN.

SCUDDER reports three cases of penetrating wound of the abdomen, and has been able to collect, in all, fifty-six cases since the tables of Morton and Markoe were tabulated (*Boston Medical and Surgical Journal*, vol. cxxxiii., No. 4). From the study of these cases the author formulates the following conclusions:

Given an abdominal wound, proof of penetration through the peritoneum should be sought. This is best accomplished by enlargement and careful investigation of the original wound.

Penetration having been found, immediate enlargement of the wound should be made for careful exploration of the abdominal contents.

Irrigation with warm salt solution should be employed if there is any soiling of the peritoneum and if there is much blood present.

The use of the probe to determine penetration is often misleading and may give a false sense of security.

The absence of shock does not prove the absence of grave intraperitoneal lesions.

A small parietal wound is not incompatible with grave intraperitoneal injuries, as is evidenced by Case 47.

The possibility of intraperitoneal strangulation through the wounded omentum must be kept in mind. Dennis, Morton, and Markoe each report a case of intraperitoneal strangulation associated with the conditions resulting from a stab.

The objects of a laparotomy following intraperitoneal stab wounds of the abdomen are: to discover (if present) and check intra-abdominal hemorrhage, to close perforations of viscera, and to prevent peritonitis and sepsis.

GENITAL HYPERÆSTHESIA ASSOCIATED WITH SHORTNESS OF THE FRÆNUM GLANDIS.

FÉRÉ states (*Revue de Chirurgie*, No. 4, 1895) that an unduly short frænum glandis not only interferes with coitus, and causes so much deviation of the meatus that fecundation may be impossible, but that it also induces genital hyperæsthesia and premature ejaculation. The condition may also give rise to sexual perversion. He reports a case in support of the views which he expressed.

A very simple operative procedure suffices to remove the abnormality with its accompanying results.

THE RESULTS OF DOUBLE CASTRATION IN HYPERTROPHY OF THE PROSTATE.

In an elaborate paper on this subject read before the American Surgical Association, DR. J. WILLIAM WHITE has collected one hundred and eleven cases that have been subjected to the operation which he proposed before the same Society in 1893. The author's study of the subject warrants the following statements:

1. The cases reported justify the removal of the operation from the region of experiment to that of practical surgery. They show that it is at least as scientific and as certain in results as many of our operative procedures. Of one hundred and two cases contained in the table, in which the condition of the prostate is noted, sixty-five, or 66.7 per cent., are reported as showing some distinct decrease in size, while in twenty-four additional cases, eighty-nine in all (eighty-seven per cent.), the improvement in other symptoms renders the conclusion justifiable that the prostate had become smaller. Microscopical examination of the prostates of two cases subjected to autopsy showed a true atrophy.

2. Many of the cases contained in the table had been previously subjected to the various palliative measures usually recommended for enlargement of the prostate, including rest in bed, catheterism, and vesical irrigation. The failure of these means to bring about an improvement decided the surgeon in charge to offer the patient the benefits to be derived from castration.

3. That the disappearance of symptoms after this operation is due to the relief of congestion and œdema is largely negatived by the previous failure of these palliative measures in many of the reported cases, as well as by the microscopical evidence of actual atrophy of the gland.

4. The disappearance of the hyperplasia is brought about by an atrophy first of the glandular and then of the muscular elements, by which the gland becomes transformed into a mass of fibrous connective tissue.

5. The digital examination of the gland suf-

fices to give the operator a sufficiently accurate impression of its size to enable him to judge whether or not there has been any reduction.

6. The disappearance in fifty-two cases of a previously intractable cystitis has been a surprising phenomenon. The author explains this by relief of congestion in the prostatic plexus of veins which is kept up by the enlargement of the prostate and the resulting consequences.

7. The lessening in the length of the urethra reported in some of the cases is brought about by the atrophy of the prostate, and not, as has been suggested, by the mere effect of relieving an overfull bladder. Finger has shown that, on account of the inclusion of the pars prostatica in the bladder, the urethra is considerably shorter when the bladder is full than when it is empty. This fact he has demonstrated experimentally.

8. The return of power in the bladder has been in some cases (sixty-six per cent.) as surprising as the disappearance of the cystitis.

9. The presence of a vesical calculus does not offer any contraindication to the operation, but, on the contrary, the author has deliberately performed castration preliminary to litholapaxy.

10. That the permanent value of the operation might be determined, the author divided the cases into (*a*) those reported immediately after the operation,—*i.e.*, within the first two or three weeks, and from which nothing had been heard further; these number seven, or 8.7 per cent. (*b*) Those in which from a month to three months elapsed before the patient passed from observation, and in which the prostatic changes and the improvement in symptoms were carefully noted; these number sixteen, or twenty per cent. (*c*) Those observed after three months, and in which the local changes seemed to have reached their culmination and the health of the patient appeared to be permanently re-established; these were fifty-seven in all,—a percentage of 71.3.

The conclusions which seem warranted by the arguments used and the facts set forth are as follows:

1. The function of the testis, like that of the ovary, is twofold,—the reproduction of the species and the development and preservation of the secondary sexual characteristics of the individual. The need for the exercise of the latter function ceases when full adult life is reached, but it is possible that the activity of the testis and ovary in this respect does not disappear coincidently, and that hypertrophies in closely allied organs like the prostate and uterus are the result of this misdirected energy. This hypothesis would increase the analogy between the fibromyomata of the uterus and the adeno-fibromata of the prostate, which, from a clinical stand-point, is already very striking, and is further strengthened by the almost identical results of castration in the two conditions.

2. The theoretical objections which have been urged against the operation of double castration have been fully negatived by clinical experience, which shows that in a very large proportion of cases (thus far in approximately 87.2 per cent.) rapid atrophy of the prostatic enlargement follows the operation; and that disappearance or great lessening in degree of long-standing cystitis (fifty-two per cent.), more or less return of vesical contractility (sixty-six per cent.), amelioration of the most troublesome symptoms (eighty-three per cent.), and a return to local conditions not very far removed from normal (46.4 per cent.) may be expected in a considerable number of cases.

3. The deaths have been twenty in one hundred and eleven cases, a percentage of eighteen. But of these there seem to be thirteen that may fairly be excluded in an attempt to ascertain the legitimate mortality in patients operated upon under surgically favorable conditions,—*i.e.*, before the actual onset of uræmia or, better, before the kidneys have become disorganized by the two factors rarely absent in advanced cases, backward pressure and infection. This would leave a mortality of 7.1 per cent., which will probably be decreased as advancing knowledge permits of a better selection of cases. It is important to note that even in the desperate cases which make up this series of deaths, fifteen (seventy-five per cent.) showed improvement of symptoms or shrinkage of the prostate before they died.

4. Comparison with other operative procedures seems to justify the statement that, apart from the sentimental objections of aged persons, on the one hand, and the real, entirely natural, and very strong repugnance to the operation felt by younger patients, castration offers a better prospect of permanent return to nearly normal conditions than does any other method of treatment. The relatively greater degree of improvement in successful cases should be considered, as well as the mortality, in comparing the operation with the various forms of prostatotomy and prostatectomy. So, too, should the absence of any risk of permanent fistulæ, peritoneal or suprapubic, the ease and quickness with which the operation can be

performed, and the possibility of avoiding altogether the use of anæsthetics, which, in these cases, are in themselves dangerous.

5. The evidence as to unilateral castration is at present contradictory, but there can be no doubt that in some cases it is followed by unilateral atrophy of the prostate, and in two cases, at least, it has resulted in a very marked improvement of symptoms. It is worthy of further investigation.

6. Experiments on dogs have shown, in nearly every case in which the vas deferens was tied or divided on both sides, that, without much change in the testicles, there were beginning atrophy and considerable loss of weight of the prostate. These experiments need repetition and confirmation, as the absence of corresponding testicular change seems to make the results somewhat anomalous. It is possible that the inclusion or severance of small but important nerves may account for the effect on the prostate.

7. Ligation of the vascular constituents of the cord, or of the whole cord, produces atrophy of the prostate, but in my experiments only after first causing disorganization of the testis.

A CASE OF TETANUS TREATED WITH TETANO-ANTITOXIN, AND A REVIEW OF THIRTY-EIGHT OTHERS.

MARSON details (*Lancet*, London, No. 3754, 1895) a case of tetanus treated with antitoxin, and although the case terminated fatally, the author was able to draw certain conclusions from his experience. The disease had followed a small wound of the thumb, which looked very unhealthy at the time of admission to the hospital. The case was a mild one from the beginning. The early treatment consisted in the administration of quinine and physostigmine, and later potassium bromide and chloral. In the opinion of those who saw this patient, the fatal termination was due to septicæmia. In the case reported the antitoxin injections had a marked beneficial effect on the rigidity and general condition.

He thinks the average mortality of tetanus in chronic cases may be regarded as fifty per cent., and in acute or severe cases as ninety per cent. He has arranged in four groups all the recorded cases of treatment of tetanus by immunized serum. Of the thirty-eight cases collected, only twenty-two were fully reported; they fall under their respective heads as follows: (1) cases in which the symptoms commenced to abate immediately after injection and then steadily disappeared, nine; (2) those which remained *in statu quo* for a short time after injection and then gradually improved, six; (3) those in which no further muscles became involved in spasms after commencement of treatment, though occasionally an aggravation of certain other symptoms (as trismus and difficulty in swallowing) occurred, two; and (4) those ebbing fatally notwithstanding treatment, five. Space does not permit of a detailed notice of the cases; but, in spite of the unfavorable result of the case treated in the Staffordshire General Infirmary, he has come to the following conclusion: In his mind there is no doubt that the antitoxic serum has a favorable effect in certain cases of tetanus, and those not always of the mildest form. This serum may be justly called a remedy for the disease of such importance that up to the present time no other method of treatment can bear comparison with it. He is of opinion that the antitoxin serum is destined considerably to decrease the mortality in tetanic cases, and he does not doubt—although there is probably much to be learned and many details have to be modified or altered—that the hopes raised by it will be fulfilled.

TWO CASES OF SEPTICÆMIA DUE TO MIDDLE-EAR DISEASE; OPERATION; RECOVERY.

The following two cases are reported by NASH (*Lancet*, London, No. 3753, 1895): A boy, aged twelve, had had otorrhœa for five years. After a blow upon the ear the boy complained of headache and later of vomiting. By the next morning the patient had headache, photophobia, fever, and he was delirious. In spite of thoroughly irrigating the ear and trephining the mastoid antrum, the patient developed a pleuro-pneumonia. It was decided to explore the lateral sinus, as it was thought this might be the seat of thrombosis. After exposing the sinus, a hypodermic syringe was introduced and normal blood obtained. The wound was, therefore, closed. There was no pus found at the time of operating on the mastoid.

The second case was that of a boy fifteen years of age who had suffered from otorrhœa for two years. After exposure to cold, the ear condition became aggravated and headache and fever supervened. He was found flushed and drowsy, he objected to light, and was very deaf. There was a commencing optic neuritis. The condition demanding operation, a small trephine was applied just above and behind the meatus, and the middle fossa of the base of the skull was

opened. The dura was found to be healthy. Next the mastoid antrum was opened; the bone behind this was very soft, and while gouging it an abscess was opened, lying between the bone and the lateral sinus. The wall of the lateral sinus was thickened, discolored, and sloughing. In the absence of rigor it was not deemed necessary to tie the internal jugular vein. On account of a chill, this was tied and divided on a level with the cricoid cartilage on the following day. The wall of the lateral sinus was cut away and a dark blood-clot exposed. The convalescence was slow and interrupted by a number of minor complications.

This case exemplifies an interesting sequence of events,—viz., chronic otorrhœa, suppuration in the mastoid antrum, subdural abscess, and thrombosis of the lateral sinus. The course of events, modified by treatment, was as follows: (1) the subdural abscess and mastoid antrum were cleared out and drained, but already the septic inflammation had involved the lateral sinus; (2) absorption of septic material from the thrombus necessitated ligature and division of the internal jugular vein to cut off the source of infection from the general circulation (the lateral sinus was opened to permit of the escape of the breaking-down clot); (3) it was necessary to reopen and enlarge the mastoid wound to allow pus to escape from the lateral sinus; and (4) the subcutaneous abscess in the neck was opened. The cause of this abscess seems to have been one of two. Either it was cellulitis due to septic material carried by the lymphatics from the wound behind the ear, or it was due to the breaking down of the clot in the jugular vein, between the base of the skull and the ligature.

Obliteration of the left internal jugular vein, by clot or ligature, gives rise to less disturbance of the cerebral circulation than obliteration of the right vein, as the superior longitudinal sinus usually enters the right lateral sinus, which is then much the largest. The abnormally low entrance of the common facial vein into the jugular was also of interest, as through it the blood coming from the brain through the angular vein was able to reach the jugular below the ligature. The question arises, Should the lateral sinus have been ligatured outside the torcular Herophili, as is advised by Mr. Arbuthnot Lane? It would have been wise to have done so, and certainly better surgery. Suppuration must have occurred as far as the torcular Herophili, and one sees no reason why it should not have gone on extending further. In fact, it probably would have done so had not a drainage-tube been introduced into the sinus. The risk incurred by ligaturing the sinus must be small compared with that from the extension of the septic thrombus.

RECENT ADVANCES IN CEREBRAL SURGERY.

Von Bergmann (*Centralblatt für Chirurgie*, No. 27, 1895), at a recent Congress of the German Surgical Society, held at Berlin, brought under notice certain advances that have been recently made in the department of cerebral surgery. In cases of tumor of the brain, surgery has of late done very little beyond facilitating a correct diagnosis and rendering operative interference less dangerous. In Jacksonian epilepsy surgical treatment is usually followed by relapse, and can effect a certain cure only in those cases in which the convulsions are due to the compression of a circumscribed cortical motor centre by a tumor, as, for instance, a cyst of traumatic origin. On the other hand, very decided progress has been made in the operative treatment of different forms of intracranial suppuration of otitic origin, such as cerebral abscess, epidural suppuration, infective thrombosis of the lateral sinus, and leptomeningitis. The most dangerous forms of chronic aural suppuration, which is usually excited by a collection of cholesteatoma in the interior of the ear, are indicated by intercurrent acute and subacute attacks, with fetid discharge, and by the presence of polypoid granulations on the tympanic cavity and the auditory meatus. The extension of the inflammation through the thin and carious tegmen tympani sets up pachymeningitis, which, in its turn, gives rise to an extradural or epitympanic abscess, or to an intradural cerebral abscess. The cerebral abscess, when small and in an early stage of development, is situated at the surface of the brain, but as it enlarges it sinks into the substance of the affected lobe. As the diagnosis between a superficial and epitympanic abscess, on the one hand, and a cerebral abscess, on the other, is attended with much difficulty, Von Bergmann holds that it is necessary in performing an operation to expose to view both the extradural abscess and the part of the temporal lobe most likely to be involved in the extension of the suppurative process. An operation is described by which the upper and anterior surfaces of the petrosal bone are exposed through a quadrangular opening made in the squamous portion of the temporal bone, just above the line of the zygoma, and between a line in front drawn directly upward to the sagittal suture from the tragus, and a parallel

line behind carried upward from the posterior border of the mastoid process. By this wound the mastoid antrum and cells may be opened, if necessary, and the sigmoid fossa be reached. In conclusion, Bergmann alludes to the successful results of the surgical treatment of infective thrombosis of the lateral sinus. Exposure and incision of the sinus, with ligature of the internal jugular vein, proved successful in six out of thirteen cases treated by Jansen, of Berlin. These cases, added to those of Macewen and other surgeons, showed that the operative treatment resulted in recovery in twenty-seven out of forty-five patients. Thrombosis of the lateral sinus, it is pointed out, is often associated with extradural abscess on the roof of the tympanic cavity, and in most cases of cerebellar abscess forms a communication between this collection of pus and the suppuration in the middle ear. In exposing the outer surface of the mastoid process and the bone lying beneath this, search should be made for the mastoid emissary vein. Not only is the orifice a good guide to the sinus, but, in addition, the state of the vessel may help the diagnosis. If it contains pus, suppuration in and about the lateral sinus is indicated; if it be blocked by a thrombus, this will be a sure sign of thrombosis extending to the cavernous sinus. Von Bergmann, attributing much of the recent progress in cerebral surgery to improvements in technical details and in instruments, makes use, in opening the skull, of a circular saw worked by electricity, with which he divides the outer table, while the inner table is divided by the careful application of a chisel.—*British Medical Journal*, August 3, 1895.

IMBRICATION OR LAP-JOINT METHOD; A PLASTIC OPERATION FOR HERNIA.

ANDREWS describes, in the *Chicago Medical Recorder*, August, 1895, what he thinks may justly be entitled "A New Operation for the Radical Cure of Hernia." The earlier operations that were employed failed, the author says, because (1) unless a hernial protrusion be stopped at its point of outlet,—namely, the internal ring,—no amount of closure below will surely prevent its recurrence. But (2) if it be effectually blocked by the repair of this weak point, no attention need be given to the parts below. Even the extirpation of the sac is not absolutely necessary, excepting that portion lying in the canal. The acceptance of this view would relegate to obscurity all the older literature of the subject up to the time of Bassini, including the work of Wood, Heaton, McDowell, Bell, Barker, Nussbaum, Czerny, Sewell, and others. The author states that an extended experience leads him to assert emphatically that the sealed aseptic wound will remain aseptic in this locality and that no other will. Drainage is therefore to be avoided.

An incision is made parallel to Poupart's ligament, about three centimetres above it, and carried from near the pubis to a point a little above the internal ring. The superficial epigastric artery is always cut and tied. All steps of this operation must be clean and bloodless. Failure to arrest the hemorrhage during its progress will interfere with the subsequent steps. Directly beneath the skin incision, after complete hæmostasis, another of equal extent is made parallel with the coarse fibres of the external oblique, which are always tendinous here. The lower termination of the incision is near the external ring, which the author finds need not be divided in all cases. A scrotal sac can always be drawn up without injuring the external ring, and if the testicle is found to be adherent, it may be returned to its proper position by the same route through which it came out. If the scrotal part of the hernial sac does not readily come up through the ring, it may be cut off at its neck and only the portion in the canal be removed. O'Hara, of Melbourne, has shown that there is no objection to leaving the scrotal sac. As a rule, no difficulty is experienced in stripping out the sac, and, as a rule, it is better to remove it, except in cases of congenital hernia. After being cut off, it may be cross sutured at the base and returned to the abdominal cavity without further attention.

The canal being cleared of all structures but the spermatic cord, the latter is lifted gently from its bed and held by retractors during the real preparative work. The posterior wall of the canal, up to and including the internal ring, is narrowed by suturing the conjoined tendon and the transversalis fascia firmly to Poupart's ligament from below upward with a kangaroo tendon suture. The imbrication, which is the special feature of this operation, consists in the incorporation of a strong layer of external oblique aponeurosis into the posterior wall of the canal along with as much conjoined tendon and transversalis fascia as can be found, and the preservation of another flap of the same strong fascia to form the anterior wall. The purpose is to lap joints in uniting the several layers of the wound. The author claims the following advantages for this method:

1. A large strong flap of any needed size to fill the internal ring.

2. Triplicate layers of aponeurosis.

3. Interlocking of layers giving broad surfaces of union.

4. Shortening of anterior as well as posterior wall of the canal, making them mutually supporting and relieving tension on deep suture.

5. Cord amply protected.

NEPHROPEXY.

VULLIET (*Rev. Méd.*, No. 6, June, 1895) describes an operation undertaken by himself and his colleague, Poullet, for fixing a floating kidney. The usual method of fixation by suture is unsatisfactory, owing to the friability of the kidney tissue. The operation reported substitutes a living tendon, which firmly fixes the kidney in position. The experiment was first tried on a large dog and proved satisfactory. A patient suffering from an extreme displacement and unable to walk or gain her living was chosen for the operation. An ordinary extraperitoneal incision was made to reach the kidney. A second incision, eight centimetres in length and having its centre opposite the first lumbar spine, was made parallel with and two centimetres external to the dorsal spines. The teguments and dorsal aponeurosis were incised and the tendinous slips of the dorsalis longus found. The tendon which is inserted into the first lumbar was chosen, this being of about the proportions of a stout shoelace, and usually about twenty-two to twenty-four centimetres in length. This was raised by two fingers inserted beneath, and by traction stripped up to its insertion, near the shoulder, shreds of muscular tissue being left attached to its free end. A strong stylet was then passed through the muscles between the twelfth dorsal and first lumbar vertebra into the abdominal cavity; the tendon threaded on this and drawn through. The kidney was then drawn out through the first incision and a stylet passed from below up beneath the capsule along the posterior border. The tendon was threaded through this and drawn downward, reappearing at the lower part and leaving a free end four or five centimetres in length. This was passed outward through the muscles of the posterior abdominal walls and fixed with metal sutures in the wound, the tendon having described in its course the figure 8. The operation was extraperitoneal; there was hardly any hemorrhage, no temperature, and hardly any pain. The wounds healed by first intention in eight days, and the patient was shortly afterwards discharged comfortably cured.—*British Medical Journal*, August 10, 1895.

THE SURGICAL TREATMENT OF PERFORATING ULCER OF THE STOMACH.

In a lecture on this subject, BARLING (*Birmingham Medical Review*, August, 1895), after a consideration of the anatomical relations of the stomach, the symptoms, and the diagnosis, states that immediately after the perforation of an ulcer a certain line of treatment must be followed, whether it is proposed to resort to operation or not. Collapse must be met by external warmth and by enemata of warm fluids and stimulants. Nothing should be given by the mouth if it can possibly be avoided, as it may lead to further extravasation or may cause vomiting, which, in its turn, squeezes the contents of the stomach through the perforation. The severe pain calls for morphine, which should be given hypodermically. The patient should be kept in a horizontal position as far as possible, to prevent extravasated materials from spreading widely from the point of perforation, where they may soon become localized by adhesions. If operation is declined, or for any reason is not deemed advisable, the patient should be kept rigidly in the horizontal position and food by the mouth withheld for several days, unless the patient's general condition imperatively demands it. Morphine should be given from time to time to keep the patient quiet and free from pain and to lessen peristaltic movement. If operation is decided upon, sufficient delay to allow of recovery from collapse is not only justifiable, but is called for, in face of the fact that the operation may be prolonged and therefore severe. A vertical incision about four inches long should be made, commencing a little way from the ribs, either in the middle line or somewhat to the left of it. The operator should not attempt to deal with the condition through a small opening, which will only embarrass him and delay the progress. The parts are carefully examined through the incision to determine the amount of extravasation and the point of perforation. Usually the fingers passed up between the stomach and liver will detect any fluid which has escaped from the stomach. This should be carefully cleansed away with sponges. If the position of the perforation is not accessible, there should be no hesitation in making a second incision to the left. As a rule, the point of perforation will be detected by the finger by recognizing the induration around the ulcer. Having detected the opening, the next step is to empty the stomach of its contents. This the author was able to do, in one case, by passing a tube through the perforation. Usually, however,

it will be necessary to pass an œsophageal bougie for this purpose. In dealing with the ulcer the author advises simple enfolding with Lembert's sutures in preference to incision. From six to twelve stitches may be required, all of which should be introduced. A second line of sutures to re-enforce the first will often be desirable.

If the extravasation has been wide-spread, or if general peritonitis exists, the abdominal cavity should be irrigated ; otherwise it is undesirable. The author advises the use of a drainage-tube down to the seat of operation. If the general cavity has been irrigated, it might be useful to introduce a second tube just above the pubis.

In the event of operations performed after the formation of an abscess, the incision should be made over the most prominent part of the swelling. It is not desirable in these cases to look for the perforation. Drainage will always be required. In the event of an extensive subphrenic abscess, it may be necessary to excise two or three inches of the eighth rib in the mid-axillary line in order to secure proper drainage. The author has collected reports of thirty-one early operations and six late operations, with thirteen recoveries. He urges upon the profession the necessity for early diagnosis and treatment of this trouble.

In a brief reference to the subject of perforation of a duodenal ulcer, the author states that the same remarks apply as in the case of gastric ulcer.

SYPHILIS OF THE HEART.

MRACEK (*Med.-Chir. Centralblatt*, June 21, 1895), quoting authors on this topic, points out that the disturbances of the action of the heart are not uncommon during the secondary period of syphilis, especially just preceding the roseola. He quotes Fournier to the effect that these troubles are functional and not dependent upon distinct lesions of the heart itself, and that they are distinctly transitory by nature, disappearing without leaving a trace, occurring much more frequently in women, and commonly associated with nervous disturbances. The later forms of heart syphilis appear, however, as distinct pathological changes. The symptoms of the affection are those of degeneration of heart muscle or interference with the valves, whatever be the cause of these pathological conditions.

Semmola holds as pathognomonic a persistent arhythmia, either existing alone or accompanied by tachycardia, respiratory troubles coming and going, resistance to all ordinary methods of treatment, and a history of syphilis. Through syphilitic stenosis of the coronary artery the symptoms of angina pectoris may be caused. Exceptionally murmurs are developed. The course of syphilis of the heart is extremely slow and insidious. There is rarely any acute process, such as softening of a gumma, but rather a slow transformation into fibrous tissue. Judging from reported cases, the prognosis is extremely bad, death coming suddenly and often in the midst of apparent perfect health. In sixty-three cases collected by the author this suddenly occurred in one-third of the number.

Jullien and Mauriac stated that this end is observed in fifty per cent. of cases. Death comes after a heavy meal or from drinking or straining. Often the patients are found dead in bed. Many cases perish in coma from heart-failure. Some die of embolism.

When the disease is recognized early and properly treated the prognosis is fairly good. According to Rosenfeld, respiratory disturbances, if of long standing, are always of serious import, as is albumin in the urine. Buchwald and Semmola hold that if the symptoms are simple arhythmia without further objective appearances, the specific treatment promises well. Frequently, however, the patients do not observe this symptom, and come for treatment only when the disease is well advanced and such changes are produced that specific treatment promises little or nothing, degenerative processes having extended so far that restitution of tissues to normal is impossible. Even in the most severe forms a relative improvement under treatment is nearly always noted.

Treatment must be thorough and long continued ; immediate effects cannot be looked for, since this is a late manifestation of the disease. Every advantage must be taken of air, surroundings, food, and general hygienic regulations. The mixed treatment serves the best purpose. Iodide of potassium should be given in large doses of 90 to 120 grains a day, and mercury should be administered in the form of inunctions. This treatment should have frequent intermissions.

INTERNAL CHOLEDOCHODUODENOSTOMY.

KOCHER (*Corresp. Blatt. für Schw. Arz.*, April, 1895) operated on a person suffering from cholelithiasis. There were attacks of pain and serious digestive troubles and marked icterus, accompanied by chills and febrile symptoms. Progressive failure in general health suggested the necessity for intervention.

On opening the abdominal cavity the liver seemed normal. The gall-bladder was contracted and contained very little bile. In passing the finger behind the duodenum a large calculus was found. Efforts at breaking this were unsuccessful, nor could the duodenum be drawn aside. Hence its anterior wall was incised transversely, its posterior wall was cut through, and finally the common duct was opened and the calculus readily removed. The opening of the common duct was then secured to the posterior duodenal wound and the anterior duodenal wound was closed by suture. The patient was completely well at the end of a month and a half and suffered no more from attacks of pain or icterus. This operation stands alone.—*Gaz. Méd. de Paris*, June 29, 1895.

PROSTATIC ABSCESS CURED BY PERINEAL OPENING AND CURETTAGE.

GAUDIN (*Annales des Maladies des Org. Génito-Urin.*, February, 1895) reports a case of prostatic abscess cured by perineal opening and curettage. The prostate was exposed by a semi-circular incision in front of the anus; the abscess was opened, was thoroughly scraped out, and was drained by gauze. During convalescence instillations of sublimate were made into the bladder and posterior urethra. An examination of the material removed from the prostate showed many tubercle-bacilli, and in the urine before operation these bacilli were also found. The patient made an uninterrupted convalescence.

THE DIAGNOSIS OF URETERAL AND RENAL DISEASE IN WOMEN.

In this paper (*International Journal of Surgery*, June, 1895) DR. H. A. KELLY confines his remarks to some new methods of investigation that he has been engaged in developing during the past year, and considers the following three methods of diagnosis: I., inspection; II., catheterization of the ureter; III., catheterization of the pelvis of the kidney.

I. *Inspection.*—in the ordinary examination without incision, inspection is limited to the ureteral orifices in the bladder; and in order to see them and to carry out the suceeeding steps to be described it is necessary to adopt the following method:

1. The patient is asked to urinate.
2. She is placed in the knee-chest position.
3. A ten-per-cent. cocaine solution is applied to and within the external urethral orifice for five minutes.
4. The urethra is dilated, when necessary, with a single conical dilator up to nine or ten millimetres in diameter.
5. A simple, cylindrical, vesical speculum, provided with an obturator, is next introduced into the bladder, and the obturator withdrawn, when the bladder at once balloons out with air.
6. The examiner, with a head-mirror on his forehead, now reflects into the bladder a light (preferably electric), held as near the sacrum as possible.
7. By turning the speculum thirty degrees to the right or left and dropping the handle the ureteral orifice comes into view.

The view is limited to this area, and three points are to be noted:

a. The appearance of the orifice and its surroundings. In inflammatory disease of the ureter or kidney this is often red, œdematous, puffed out, mammillated, or even slightly ulcerated. In tuberculous disease descending from the kidney the author has seen the infection thickly strewn over a triangular area, the apex of which was at the orifice.

b. The character of the fluid seen issuing from the orifice will often settle the diagnosis and determine the plan of treatment. In cases of hæmaturia, pyoureter, and pyelonephritis there is no difficulty in picking out the affected side, and seeing by the clear urine issuing from the other side that it is sound. When no discharge takes place it may sometimes be started by making bimanual pressure upon the renal tumor.

c. Normally the urine flows in intermittent jets of a clear, limpid fluid. If one side discharges in this way and nothing comes from the other, there must be some obstructive disease. Pus accumulations, when they escape, are likely to flow in a continuous sluggish stream. Attention is called to the fact that it is possible to catch the urine, as it escapes, directly in the speculum, and take it up for microscopic, chemical, and bacteriological examination without passing a catheter into the ureter.

II. *Catheterization of the Ureter.*—In carrying out this procedure strict attention must be paid to antiseptic details, which may be briefly summarized as follows:

1. Use an antiseptic speculum.
2. Cleanse the ureteral orifice with a pledget of cotton held in mouse-tooth forceps.
3. Have a sterile catheter not contaminated by handling.
4. Avoid contamination of the catheter during the introduction.

5. Place the sterile outer end (protected up to this time with a piece of rubber tubing) in a test-tube to collect the urine as it flows from the ureter without contamination.

Kelly uses three kinds of catheters. That which he prefers is a flexible silk catheter thirty centimetres long and two millimetres in diameter. In introducing the catheter, it is engaged in the orifice of the ureter and pushed in for a distance of twelve or fifteen centimetres. It may be left there to drain in the ureter as long as desirable. He also uses a simple, straight, metallic catheter, which, however, is more liable to bruise the ureter, and a short metallic catheter, which is introduced entirely within the bladder and ureter, and discharges through a fine rubber tube. Both ureters may be drained easily at one time with the flexible catheters.

By noting the time the catheter is put in place and removed the rate of flow may be determined, and by the examination of the urine the relative value of the two kidneys is determined.

III. *Catheterization of the Kidney.*—For this the author has had made renal catheters fifty centimetres long, which are kept sterilized in glass tubing, and when introduced are simply drawn out of the tubing as they are pushed into the ureter. In this way he has drawn pus from the kidney, evacuating a large renal abscess, and by irrigating the abscess cavity through the catheter he has cured a pyonephrosis.

GASTRO-DUODENECTOMY.

KOCHER (*Deut. Med. Woch.*, vol. xxi., Nos. 16–18, 1895) reports sixteen cases of gastro-duodenectomy, the stomach being closed after resection of the cancerous portion. There were only two operative deaths. Of nine living cases, four have remained well for more than a year and a half after the operation.

CYSTITIS DUE TO TAKING LARGE QUANTITIES OF BICARBONATE OF SODIUM.

MATHIEU (*Société des Hôpitaux*, March 22, 1895) reports a case of cystitis due to taking large doses of bicarbonate of sodium. This inflammation became at times so intense that there was distinct hæmaturia. The author states that it is important to remember that an alkaline treatment may at times produce this result.

HAYEM, in commenting upon this case, states that large doses of alkalines when the urine is itself not strongly acid, by making this fluid alkaline, encourage the multiplication of the vesical microbes and thus set up an active cystitis.

SILK VERSUS CATGUT.

KOCHER (*Universal Medical Journal*, June, 1895) states that in his operations for goitre primary union was obtained in only thirty-five per cent. of the cases when sterilized catgut was used, but in 85.7 per cent. when sterilized silk was used. He has now completely abandoned aseptic sutures, and only employs silk made antiseptic by an alcoholic solution of bicloride of mercury. Since adopting this method he has obtained primary union in every case.

TREATMENT OF FRACTURED FEMUR BY SUTURE.

WALTHER (*Rev. de Chir.*, May, 1895) has recently communicated to the Société de Chirurgie of Paris the case of a man who, in falling from a wagon, received a severe injury to the knee. The lower end of the femur was broken into three fragments, and the tibia was displaced backward. The internal condyle remained attached to the tibia and had been carried backward with the head of this bone. Walther, finding that the reduction and coaptation of the fragments of the femur would be attended with much difficulty, opened the knee by a long incision on the antero-internal aspect of the joint, placed the osseous fragments in contact and in their normal relations, and fixed them together by sutures. The patient made a good recovery. Twelve months after the operation the knee was still slightly swollen and the injured limb a little shorter than the other, but the patella was movable and the leg could be freely flexed and extended by the patient, who was able to walk without any difficulty and to follow his occupation of floor-walking. The result, the author holds, is certainly far superior to what would have been obtained by practising the ordinary treatment of fracture.—*British Medical Journal*, June 15, 1895.

COLLECTIVE INVESTIGATION ON ANÆSTHETICS.

GURLT (*Universal Medical Journal*, June, 1895) states that in Germany the collective investigation upon anæsthetics has now been going on for five years. The use of ether has much increased. The mortality from chloroform seems to be much greater than that from ether, but very often grave disorders of the

respiratory organs, such as pneumonia and bronchitis, result from the inhalation of ether, and death from those complications ought to be regarded as equivalent to death under anæsthetics. Ether was especially harmful after laparotomy.

SCHLEICH holds that anæsthetics are more dangerous the more their boiling-points differ from the temperature of the body. He has devised an anæsthetic mixture (chloroform and petroleum-ether) whose boiling-point is the same as the temperature of the body, and has obtained excellent results, all disagreeable sequelæ being absent.

ROSENBERG recommended that the mucous membrane of the nose be brushed with a solution of cocaine before the commencement of the narcosis.

REHN warns against the use of chloroform near a gas-light, as ethylene chloride is formed.

DANGERS OF THE CURETTE.

PICHEVIN (*Ann. de Gynèc. et d' Obstet.*, May, 1895) believes that the curette is of high value, but the more it is employed the more its dangers must be borne in mind. Abortion has been produced, and even relatively advanced pregnancy has been mistaken for simple enlargement of the uterus or interstitial fibroid, to the dismay of the operator. Septic troubles have followed the use of this instrument, but with antiseptics this accident is very rare. Far more insidious is the danger from overlooking pelvic abscess: a pysosalpinx has been burst with fatal results. Uterine artresia due to abuse of the curette has been noted by two authorities only. The most probable and frequent accident is perforation of the uterus by the curette itself. In 1854, Richard, a great supporter of Récamier, noted a case of perforation. It was soon found that, as in the case of perforation by the uterine sound, the results were far less serious than theory would lead one to suspect. Still, there is no fear that the operator discovering the accident will think it a trifle. As to the causes, softness of the uterine tissues, especially in the puerperium, greatly increases the chance of perforation. The uterus, in some reported cases, may have been wounded by the dilator before the introduction of the curette, which then receives blame which it does not deserve. Ignorance and roughness have certainly been the sole causes of the accident in some instances. One operator confessed that he once sent the curette clean through the uterus till the handle lay so deep that it could not be withdrawn without the aid of a long-handled forceps. The walls may have been soft, but no doubt there was want of caution in this case. As a rule, the perforation takes place close to one of the cornua. Turning to diagnosis, Pichevin notes that in one case, in which perforation was suspected, the curette had simply slipped into an abnormal cornu. The theory of catheterization of the Fallopian tube has been brought forward to explain certain cases where the curette has slipped far into the patient's body without evil results. The phenomenon itself, however, has seldom been satisfactorily demonstrated, even in the case of the uterine sound. Symptoms of perforation vary from total absence to the most alarming subjective and objective conditions, such as profound collapse and the appearance of a coil of intestine at the vulvar orifice. Hence there is no rule for treatment. Pichevin holds that hysterectomy is too severe a measure in an average case. When the curette has penetrated the wall and the antiseptic solution injected during the scraping process has entered the peritoneal cavity, Douglas's pouch should be opened and drained. —*British Medical Journal*, June 15, 1895.

NATURE AND TREATMENT OF OSTEOMALACIA.

LABUSQUIÈRE (*Annales de Gynécologie et d' Obstetrique*, June, 1895) after a *résumé* of the general pathogenic theories of osteomalacia and the method of treatment in this affection, quotes Winckel's conclusions that castration as a treatment of osteomalacia is indicated only when either every therapeutic method has been exhausted or when the disease has so advanced that life is seriously and immediately threatened.

Truzzi collected ninety-eight cases, only fifty-two of which he carefully studied, since the others were reported so shortly after operation as to make these records of little value. Of these fifty-two cases, thirty-six were completely cured, four were nearly cured, three were cured after a recurrence, three were benefited, four showed persistent recurrence, and one was completely unsuccessful. Truzzi states as a result of his study that incomplete cures or failures result in about twenty per cent. of all cases, but that better results may be obtained when both uterus and ovaries are removed. He points out that there have been no recurrences in cases in which both uterus and ovaries were removed.

Fehling reports fourteen cases treated by castration and six by Porro's method. One

case perished immediately after operation from intestinal occlusion; one case disappeared after a year; four cases, after remaining well two or more years, died,—one of heart-disease four years after intervention, one of pulmonary phthisis three years after operation, one of cancer of the stomach and pulmonary hemorrhage after two years, the fourth of an unknown affection after three years. Eight cases operated on are still alive. Six of these are in perfect health; two remained well for two years, then showed some slight recurrence. In other words, in twelve cases there were twelve cures, which persisted for from two to seven years; two were only partially successful, but there was enough improvement to enable the woman to walk. In those cases reported in which Porro's operation was performed, one died of septicæmia; of the remaining five, four are perfectly well, and the fifth presents slight recurrence. The criterion of definite cure was the ability to walk and work without pain in the bones, and the complete suppression of the menses.

Labusquière concludes his paper as follows: The etiology of the disease is unknown. Medical treatment sometimes cures, and should be tried. When the disease is well advanced and has resisted all other treatment, bilateral castration should be performed. In certain aggravated conditions the utero-ovarian amputation is indicated. When the woman is pregnant, induction of premature labor should rarely be considered. At term, the choice between Porro's operation and Cæsarean section should be made. The former operation should usually be chosen.

THE TREATMENT OF RUPTURE OF THE UTERUS.

FRITSCH (*Medicinisch-Chirurg. Centralblatt*, No. 24, 1895) states that when a rupture of the uterus is seen five or six hours post-partum danger of hemorrhage is over. The belly is found painful and distended, the blood effusion can be felt. If, under these circumstances, there has been no bleeding for several hours and the pulse is not rapid, the author advises a conservative treatment, since the fresh blood in the peritoneal cavity is not only aseptic, but a distinct antiseptic fluid, and in case there has been any infection it will do no harm, and by the process of auto-transfusion will tend to relieve quickly the symptoms due to the original hemorrhage. Even when fever is present it is not possible to render the septic peritoneal cavity antiseptic by washing. The greatest opponent to sepsis is the healthy peritoneum. When this is irritated by chemicals and by cold, and its vitality lowered, it is not in position to absorb and to limit inflammation. The danger of sepsis is increased. Neither should there be washings from below nor laparotomy from above, since by these means the adhesions which have been already formed are separated. The patient should be kept absolutely quiet. The bowels are kept from moving by small, repeated doses of opium; the urine is drawn by a catheter; over the belly is placed an ice-bag. If bleeding has ceased for six hours it will not return. In case the amniotic liquor, together with the aseptic contents of the vagina, has escaped into the abdominal cavity, or the patient develops fever, or if he shows the first symptoms of general septic peritonitis, washing out is not indicated, since by means of a stream of water limiting peritoneal adhesions are readily torn. Loose iodoform may be laid in the vagina, but not in the wound, and a large absorbent disinfected compress should be placed over the vulva. Though in private practice operation should not be undertaken under these circumstances, with all hospital appliances at hand it is certainly allowable. Even when the danger of bleeding or septic peritonitis is over there may follow long-lasting, exhausting suppuration, with inflammatory exudation, compression of the ureter, or even pyæmia, resulting in weeks or months of invalidism. When the patient is still bleeding at the time she is seen, but when the surgeon is skilled in abdominal section and has the appliances of a hospital at hand, laparotomy should be adopted, with stopping of bleeding by ligature and removal of the uterus, when this is infected by microbes.

THE SPECIFIC MICRO-ORGANISM OF MALIGNANT LYMPHOMA.

DELBET, in a communication to the Academy of Science (*La France Médicale*, June 28, 1895), holds that he has completely demonstrated the infectious nature of lymphadenoma, since he has reproduced this form of cancer by inoculations of pure cultures of a peculiar bacillus upon the dog. This bacillus was found in the splenic blood of a woman in the last stages of generalized lymphadenoma. Inoculations were made into the peritoneum and muscular tissues with pure cultures of the bacillus in large repeated doses. This, the author holds, is necessary, since the micro-organism of a chronic disease such as tumor has not sufficient virulence to overcome the body re-

sistance unless it is introduced in large quantities. In one of the dogs there was rapid loss of weight, and twice the injections set up inflammatory collections which showed on opening only the bacillus injected, and which healed rapidly on evacuation. A month from the beginning of the injection this dog was bled for the purpose of obtaining serum for the inoculation of a patient suffering from lymphadenoma, which showed the same bacillus. Examination of the dog showed characteristic lymphatic enlargements. Cultures of portions of these lymphatic enlargements showed pure cultures of the inoculated bacillus. None were found in the blood. These experiments, if corroborated, will prove the first step towards the successful treatment of this now hopeless disease.

TREATMENT OF BUBO.

JANOVSKY (*Wien. Klin. Rundschau*, 1895, No. 25) exhibited two patients suffering from bubo, treated by Lang's method,—that is, the pus was evacuated by puncture as soon as fluctuation was detected, and the abscess cavity was washed out with one-half- to one-per-cent. silver solution by means of a syringe provided with a fine point. The wound was protected by a pressure bandage made of sterile absorbent cotton. Janovsky has thus treated twenty cases; sixteen were promptly cured; the remaining four required incision and excision of the glands. The time of complete cure is from ten to thirty-five days. The four failures were all most unfavorable cases. The sixteen successful cases remained well permanently. The method is warmly commended.

Reviews.

ENCYCLOPEDIE DER THERAPIE. Herausgegeben von Professor Oscar Liebreich, unter mitwirkung von Martin Mendelsohn und Arthur Wurzberg. Erster Band, I. Abtheilung.
Berlin: August Hirschwald, 1895.

The first part of this very valuable addition to the medical literature of the day has been sent us direct by its learned chief editor, whose original work has given us many practical additions to our therapeutic resources, chief among which may be named chloral and lanolin. The object of the work is to provide the physician with a concise account of the remedial resorts, the therapeutic measures, and the drugs which may prove of value to his patients, and each brief article is prepared by some competent author. The articles cover from a few lines to several pages, according to the importance of the subject considered. It must not, however, be thought that the scope of the work is limited, for the encyclopædic character of the volume causes it to include many subjects only distantly connected with the main object.

Beginning with the description of Aix as a health resort, the present volume ends with Auge Kunstliches and Attonitätspsychosen, so that it is evident that treatment is discussed not only from the stand-point of the drug or remedy, but also from the aspect of the disease. As three hundred and four pages are consumed in progressing thus far through the alphabet, an idea of the thoroughness of the completed work can be gained.

In the article on Anæsthetics the general and local agents are carefully discussed from both their experimental and practical sides, and formulas are given for the preparation of various mixtures used for the purpose of preventing pain. This article on anæsthetics is by Schleich, with a short addition by Liebreich. There are others on various subjects by Senator, Saalfeld, Langgaard, Ostertag, and many other equally eminent German authorities.

All the new and rare drugs and active principles are discussed with sufficient thoroughness to render this work of value to physician, pharmacist, and chemist, and we feel assured that to those who can peruse the German text understandingly—and the text is easier to read than it is in many Teutonic publications—it will prove of the greatest service.

We shall look forward to the future volumes with interest, and are glad that Professor Liebreich has added still another gift to the profession to which he himself has already proved so great an ornament.

IMMUNITY AND SERUM THERAPY. By George M. Sternberg, M.D., LL.D.
New York: William Wood & Co., 1895.

This is a small octavo volume of three hundred and twenty-five pages, and is designed by the author and publishers to afford the practitioner of medicine a bird's-eye view, so to speak, of the studies and results which have led to the development of artificial immunity and the antitoxin treatment of disease. No one in the medical profession is better qualified to prepare a book of this character than the eminent Surgeon-General of the United States Army, and we have gone through its pages with more than ordinary interest.

Part I. contains two chapters which are de-

voted to a consideration of Natural Immunity and Acquired Immunity. After explaining as far as possible the various reasons for natural immunity among men and animals, and showing that to some extent this is acquired by heredity, or, in other words, by the parents or ancestors having suffered from certain definite infectious diseases, the author proceeds to sum up briefly the effects of blood-serum and other organic liquids upon bacteria. In the second chapter, on Acquired Immunity, the influence of previous attacks of small-pox and other infectious diseases in a particular individual is discussed, and interesting facts are given as to the protective influence exerted by previous attacks of other infectious diseases.

Part II. is devoted to a brief historical view of the facts which we have acquired in the last few years in regard to the bacteriology of anthrax, diphtheria, cholera, glanders, hydrophobia, pneumonia, yellow fever, typhoid fever, and tuberculosis, as well as many other infectious diseases, some of which are confined in their manifestations to animals rather than men. In the article upon Cholera, in addition to the information which is given us concerning its bacteriology, the studies of Brieger and others are quoted, showing that a number of toxic ptomaines are produced by the cholera spirillum, and that some of these, when injected into animals, produce nervous or muscular spasms quite identical with those seen during an attack of cholera Asiatica. Thus, diamin gives rise to cramps and muscular tremors in inoculated animals, while another poison reduces the frequency of the heart's action and the temperature of the body. Free quotation is made in this chapter of Dr. Sternberg's own work, previously published, and the "Report of Shakespeare to the United States Government," in which the latter pointed out that Ferran's method of inoculation exercised a distinct immunizing influence during epidemics of this disease. The article upon Diphtheria is for obvious reasons one of very extraordinary interest at this time, and in it a considerable amount of statistical matter as to the influence of the antitoxin treatment is given. Fortunately, too, this chapter has been brought well up to date, papers so recent as March, 1895, being quoted. The author concludes his chapter upon this subject by reference to the criticisms of Hansemann as to the true value of antitoxin, but is distinctly in favor of this method of treatment. He states that the anti diphtherin of Klebs has been proved useless in the treatment of this disease.

Interesting information is also given in the chapter upon Hydrophobia as to the influence of Pasteur's method, the results being distinctly in favor of this treatment. We are sorry to see in this chapter that the name of so well-known an investigator as Mr. Horsley is sadly misspelled.

In the chapter upon Influenza, which covers a page, the results of Bruschettini are given, this investigator having claimed that he has successfully isolated the bacillus of this disease.

Chapter XIII. deals with the subject of Pneumonia, and the author opens it by claiming that the micrococcus of pneumonia was discovered by himself in the blood of rabbits inoculated subcutaneously with his own saliva in September, 1880, and that he made a public announcement of this fact before the Pathological Society of Philadelphia in April, 1885, in a paper which was published July 1, 1885. As Fränkel discovered the micrococcus three years after Sternberg, and as Sternberg's paper stating that it is the organism of pneumonia appeared about two weeks before Fränkel's paper, the author claims that it is scarcely fair to him to call it Fränkel's diplococcus, or the diplococcus of Fränkel, and personally we believe that if the name of any investigator must be associated as a distinctive title for this micro-organism, we should call it the diplococcus of Sternberg.

In the part of the chapter devoted to Serum Therapy of Pneumonia, considerable notice is taken of the studies of the Klemperers, but the observations of Hughes and Carter are not mentioned either in the text or in the bibliography.

In the chapter on Small-pox the author states his belief that vaccinia in the cow is a modified form of small-pox and not a specific infectious disease of the bovine species.

In Chapter XVII., under the head of Streptococcus Infection, the author reiterates the now well-recognized fact that erysipelas, puerperal fever, and certain forms of diphtheritic inflammation of the fauces, as well as some acute abscesses, are due to infection by the streptococcus pyogenes.

In the discussion of Tuberculosis a very good summary of our knowledge of the work of Koch and other equally eminent investigators is given, and the experiments of Emil de Schweinitz with attenuated cultures of the tubercle-bacillus are noted.

In the article upon Yellow Fever the methods of Dr. Freire are condemned.

At the close of each chapter a good working bibliography of the literature of the subject is given. While in some portions of the book

such copious quotations are made that it can hardly be considered as an entirely original contribution to literature, still, we can warmly recommend the volume to those who desire to put themselves in touch with the status of serum therapy in almost all the infectious diseases with which we come in contact.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS, WITH ESPECIAL REFERENCE TO THE APPLICATION OF REMEDIAL MEASURES TO DISEASE AND THEIR EMPLOYMENT UPON A RATIONAL BASIS. By Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. With special chapters by Drs. G. E. de Schweinitz, Edward Martin, and Barton C. Hirst. New (fifth) edition, thoroughly revised.
Philadelphia: Lea Brothers & Co., 1895.

The purpose of the author has been to clearly discuss the relationship between remedial agents and their application to disease. The book consists essentially of two parts, the first being a treatise on Therapeutics, both medicinal and non-medicinal, and the second being a treatise on the Treatment of Various Diseases. The following is the preface to the fifth edition:

"The call for the fifth edition of 'The Text-Book of Therapeutics' within five years after the first edition appeared has encouraged the author to use every effort to make the work of practical use to the active practitioner, and has enabled him to keep the text abreast of the latest advances which are reliable. In the present edition each article has been revised, many useful suggestions added, several articles entirely rewritten, and the antitoxin treatment of diphtheria discussed."

SYSTEM OF SURGERY. Edited by Frederic S. Dennis, M.D., assisted by John S. Billings, M.D. Vols. I. and II. Profusely illustrated.
Philadelphia: Lea Brothers & Co., 1895.

With the text-books of Holmes, Bryant, and Ashhurst covering surgical literature, particularly the latter, with a volume recently issued designed to bring the subject-matter up to date, a new system of surgery must needs present some special features to enable it to take first place in a field which in some respects has been so well covered. The fact that the contributors are all American is not in itself especially commendable. If, however, they represent the most progressive and most able leaders of the several departments, aside from their nationality, this is enough to make the new system take the leading-place as a text-book. Judging by the contributors to Vol. I., Dennis could not have made a wiser selection had he considered available the scientists of the English-speaking world.

The volume opens with a section upon the History and Literature of Surgery, by John S. Billings. W. T. Councilman writes on Surgical Pathology. General Bacteriology of Surgical Affections is discussed by William H. Welch; Rabies, by Herman Biggs; Gunshot Wounds, by P. S. Conner; Fractures and Dislocations, by Frederick S. Dennis; Anæsthesia, by H. C. Wood; The Technique of Antiseptic and Aseptic Surgery, by A. G. Gerster; Operative Surgery, by Stephen Smith.

All these articles are worthy of praise. Those which seem particularly noteworthy are: The History and Literature of Surgery (which, for the space allotted to it, is singularly complete), General Bacteriology of Surgical Infections, and Traumatic Fever, Erysipelas, and Tetanus.

The second volume of the "System" contains sections on Minor Surgery, Plastic Surgery, Military Surgery and the Care of the Wounded on the Battle-Field, Diseases of the Bones, Orthopædic Surgery, Aneurism, Surgery of the Arteries and Veins (exclusive of Aneurism), Surgery of the Lymphatic System, Diseases and Injuries of the Head, The Surgery of the Spine, and Surgery of the Nerves.

This volume is scarcely up to the high standard established by the first volume of the series. Forwood, discussing the army medical officer and his work, states that clean surgery has made possible on the battle-field the prevention of wound infection. That this may be proved true in the future is to be earnestly hoped. Past experience does not, however, justify such a statement. It is interesting to note that he is not hopeful as to the scope of laparotomy during the course of a great battle.

Senn's section on Disease of the Bones is one of sterling worth, and is not marred by frequent and often verbatim quotations from his well-known "Principles of Surgery."

Gibney's contribution to Orthopædic Surgery is most satisfactory in so far as the purposes of the general surgeon are concerned. In discussing Surgery of the Arteries, Stimson might have alluded to the many interesting experiments showing that successful suture of these vessels is possible. The question of air embolus receives brief and unsatisfactory notice, and the suggestion of Langenbeck to ligate the corresponding artery in case a large vein like the femoral or the popliteal is wounded is quoted with apparent approval, although such a procedure has long since been shown to be utterly unjustifiable.

The excellent diagram of the lymphatic glands and vessels of the head and neck

which precedes Gerrish's article is of great service in tracing the course of infection. The author fails to mention the very excellent treatment of suppurative lymphadenitis by puncture, antiseptic flushing, and pressure bandage, and does not refer to the fact that in this affection the contents of the gland are often sterile. Malignant and semi-malignant glandular degenerations, which are, unfortunately, too prevalent, are not noted.

Parks's section—Diseases and Injuries of the Head—is particularly satisfactory, not so much from its completeness, although it is worthy of high praise. considering the amount of space at his disposal, as from the fact that it is thoroughly modern and sensible.

The section on Surgery of the Spine by W. W. Keen is also worthy of high praise, particularly because of its modernness and the completeness with which the literature of the subject has been traversed.

It may be said of the two volumes which have already been issued that they fully justify the expectation which was based upon knowledge of the distinguished list of collaborators found in the index. In some respects they fill a place occupied by no other work, and are evidently destined to have a wide and well-deserved popularity.

ANNUAL REPORT OF THE SUPERVISING SURGEON-GENERAL OF THE MARINE HOSPITAL SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1893. In two volumes.

Washington: Government Printing-Office, 1894.

This "Report" presented by Surgeon-General Wyman to the Secretary of the Treasury embraces the financial statement and statistics of the various hospitals, together with appointments, promotions, etc., in the corps, statement of aid to other branches of the government service, special reports of the national quarantine stations, history of the cholera epidemic of 1893, quarantine regulations, epidemics of yellow fever, and detailed reports of a number of extremely interesting cases. As showing the conduct of a branch of the government medical service conspicuous for its excellent work, these "Reports" are of extreme interest, and are especially serviceable to those interested in the question of quarantine both in its medical and its business relations.

A MANUAL OF OBSTETRICS. By A. F. A. King, A.M., M.D. Sixth edition. Illustrated.

Philadelphia: Lea Brothers & Co., 1895.

When a small hand-book upon any special subject in medicine passes through six editions in thirteen years there is but little left to be said of it by the reviewer, for the far more valuable opinion of the mass of the profession has already stamped the work of the author with approval. The present edition is a small octavo volume of five hundred and thirty-three pages, including the index, teeming with useful information, derived from wide reading and clinical experience. Illustrations dot almost every page, yet with all its completeness the author concludes the preface to this issue with the statement that he considers it nothing but an outline or framework of the obstetric art, and that it has no pretensions to reach the elaborateness of a full-fledged treatise. There are at the present time so many very large text-books in the English language, as well as smaller publications, that it is difficult to know which is best adapted to the needs of the student and practitioner. The recently published volume of Dr. E. P. Davis has been received with favor, as has also that of Dr. Reynolds, but the frequent appearance of edition after edition of Dr. King's manual proves that, notwithstanding its able competitors, it still remains a prime favorite with book buyers. He tells us that the practice of administering ergot for the purpose of aiding in the expulsion of the placenta is a custom which is now abandoned, and that the ergot is to be withheld until such time as the uterus shall contract after being completely emptied of its contents. Pelvic deformity, malproportion between the size of the child and the pelvis, malpresentations and undilated os uteri, and the resisting, rigid perineum are all contraindications to the use of ergot. The administration of chloroform during labor is regarded with favor, although the author states that as a matter of safety he prefers ether. Neither of these anæsthetics, he thinks, should be given to a greater amount than is necessary to take the edge off the pain, but should operative procedures become necessary, they should be carried to the point of complete surgical anæsthesia.

Dr. King tells us that when chloroform is given for puerperal eclampsia it should be administered just before the beginning of each returning paroxysm in time to prevent the seizure. We are surprised, however, to note that the author believes that chloral will probably in great measure take the place of chloroform and ether in obstetrical practice, as under its influence the woman may sleep during labor without any great suffering. We are well aware that in this Dr. King is supported by a no less eminent authority than Playfair, but we do not think that the custom of so using this drug

is generally regarded with favor. Dr. King is careful to state that chloral is distinctly contra-indicated in organic cardiac lesions, and that its safety is questionable even in functional disorders of the heart.

PREFACE AND TITLES OF MEDICAL PERIODICALS, ETC., USED IN THE INDEX CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, U. S. ARMY. Vol. I. to XVI.

The title of this volume of two hundred and eighty-two pages sufficiently indicates the subject-matter which it contains. Upon the left of the page, in large black-face type, are arranged alphabetically the names of practically all the medical or scientific journals of the world, and opposite these are placed a few lines describing the journal, the place of its publication, and other information which is of interest concerning it. With such a publication there is no excuse for misquoting the titles of journals, and the volume acts as a key for the "Catalogue" itself.

CATALOGUE OF THE SURGEON-GENERAL'S OFFICE, U. S. ARMY. AUTHORS AND SUBJECTS. Vol. XVI. W to Zythus.

Under date of June 1, 1895, this, the last volume of the "Index Catalogue," marks the close of the herculean task to which Dr. Billings has devoted himself for so many years. Altogether there are contained in these sixteen volumes author titles of nearly ninety thousand volumes and over one hundred and fifty thousand pamphlets, while under subject titles are nearly two hundred thousand titles and over five hundred thousand general articles. We are glad to note that a manuscript of the second series of the "Index Catalogue," including all the titles of books and articles received too late for insertion in the first series, has been prepared, and will probably make five printed volumes of the same size and style as those with which we are so familiar. Equally good news is it that the appropriation for printing Vol. I. has been granted by Congress. The Library of the Surgeon-General's Office now contains nearly one hundred and twenty thousand books and over one hundred and ninety-one thousand pamphlets, practically all of which have been collected in the last thirty-five years. Much valuable material has been obtained for the library and for the "Index Catalogue" from exchanges with the *Index Medicus* during the sixteen years of the publication of that work of reference.

At the close of this volume will be found the corrigenda of the various volumes, and although the print in which these are given is small, it is worthy of note that throughout this immense publication so few mistakes have been found that they are all included in eighteen pages.

Dr. Billings and his collaborators have been so often thanked for their unremitting zeal that it seems hardly necessary to once more express the sense of obligation under which all medical men rest to the editor-in-chief, who has built for himself a monument more lasting than brass and of far more value to humanity.

A TREATISE ON NERVOUS DISEASES IN CHILDREN. By B. Sachs, M.D. Illustrated.
New York: William Wood & Co., 1895.

On first examining a large octavo volume of nearly seven hundred pages, with the title "Nervous Diseases of Children," the reviewer is inclined to doubt the wisdom of devoting so much space to many diseases which also very frequently attack the adults, for it must be understood that Dr. Sachs has not confined himself to a discussion of the nervous diseases which appear only in childhoed, but also has included practically all forms of nervous disorder with which we are acquainted. Frequent reference, however, to the pages of this volume during the last few months has convinced us, first, of the fact that Dr. Sachs has presented the profession with a very carefully compiled and valuable book, and that much of the information contained in it cannot be found in so useful and concise a form elsewhere. At the end of each chapter a bibliography is given, and the text is constantly illustrated by pictures which, in many instances, are original.

Curiously enough, in the chapter on Tetanus, comparatively little information is given as to the clinical results which have been obtained from the use of antitoxic serum, although the bacteriological studies concerning this disease are fully quoted.

In regard to the interesting question as to whether rheumatism is a causal factor in the production of chorea, Dr. Sachs takes a very judicial position, although he evidently tends to the belief that the relation between these two diseases is far more indistinct than many physicians have been led to suppose. In this idea we believe he is in consonance with those English physicians who have the largest opportunities of studying rheumatism and chorea. He does, however, believe that fright is an important etiological factor, and thereby differs from several eminent authorities. Dr. Sachs is unwilling to agree with Dana that chorea is the result of an infectious process. The illustrations

which we have spoken of, the character of the paper, the text, and the style of the author all leave nothing to be desired, and the volume, which closes with an appendix, entitled "A Few Therapeutic Suggestions," is a goodly contribution to American medical literature.

CLINICAL LECTURES ON DISEASES OF THE NERVOUS SYSTEM. By W. R. Gowers, M.D., F.R.S. Philadelphia: P. Blakiston, Son & Co., 1895.

The lectures which compose this small octavo volume of two hundred and seventy-nine pages were delivered at the National Hospital for the Paralyzed and Epileptic in London, and have been collected from various sources where they had been previously published. Altogether they number twenty. The ones which strike us as being most interesting are those upon Mistaken Diagnosis, upon the Principles of Diagnosis of Nervous Disease, Saturnine Tabes, and the Infantile Causes of Epilepsy. Dr. Gowers's style of lecturing is much easier than his style of writing, although, as we all know, the text of his book is quite as facile as is the text of most technical volumes. It would be hard to find a series of lectures upon clinical neurology more happily selected than these.

Correspondence.

LONDON LETTER.

BY ST. CLAIR THOMSON, M.D. (LOND.), F.R.C.S. (ENG.), M.R.C.P. (LOND).

7 September.

To-day marks the turning-point in our dull season. Our various medical journals have brought out their "educational number," full of promise of the return to active work in the wards, the laboratories, and the consulting-room. Visitors intending to spend part of their winter in study on this side would do well to buy the edition of the 7th September of either of our chief medical papers. They will therein find every information on all the numerous schools and hospitals of London. No stranger can fail to be struck with the abundance of clinical material, the number of distinguished young physicians who might make able teachers, and yet at the same time observe the dearth of teaching and of opportunity for supervised research. This, of course, applies chiefly to post-graduate classes, for the five years' course is completely and well carried out at each of the twelve metropolitan schools. In these latter, however, the teaching is conducted with a main eye to getting the students past the various examination boards, and strangers are apt to feel themselves somewhat *de trop* as well as disappointed with the teaching, if they compare it with the finished discourses in the Paris faculty or the thorough training under the tutorial or demonstrative system of the German universities. Want of centralization and co-ordination explains the dearth of systematic post-graduate teaching in London. Each of the twelve metropolitan schools is so complete in itself and is so entirely taken up with teaching its own students that it has no interest in combining with any other school for the general advancement of education. So, again, each special hospital is completely occupied with its own affairs, of which instruction is not the principal. Add to this the distance that has frequently to be traversed from one clinic to another, and the fact that the majority of the clinics are only open at the same hours in the afternoon, and it is evident that little is done to attract the senior student to our shores, and that golden opportunities of making London a great centre of medical teaching for the English-speaking race are allowed to run to waste. That this is being realized is evident from the attention lately directed to the subject from many sides. Meanwhile, the traveller in search of post-graduate instruction would be well advised to bring with him some introductions, and to limit his studies to a few conveniently situated clinics. In this way he will save time and travelling expenses, and anything he may lose in variety of instruction will be more than compensated by the opportunities he will have of becoming more quickly known to the staff, who will then give him every facility for examining and treating large numbers of patients.

The winter session commences in all the medical schools of England on the 1st of October. At many the old-fashioned inaugural address is still given. But our *fin-de-siècle* students are no longer impressed with the platitudes or flourish of trumpets to which the orator is apt to treat his audience, and several colleges have abandoned the custom. There are always refreshing exceptions to the sameness which often characterizes these discourses, and to able men the occasion frequently serves for the saying of many good things.

We are still chewing the cud of the British Medical Association meeting. In numbers it is so far the record gathering of the Society, but I have failed to get an explanation of the fact that preparations were made for from five to six

thousand members, whereas the number only reached about three thousand. This is the more remarkable when we remember that the membership of the Association now amounts to sixteen thousand. When the last annual gathering took place in London, in 1873, the membership did not exceed six thousand. This year's meeting was favored by a large number of foreign visitors, and the States were exceedingly well represented, as witness the opening address on Cancer of the Larynx, given in the Section of Laryngology by Dr. Delavan, of New York, the demonstration by Dr. Murphy on the button of that ilk, the speech of Professor Bowditch at one of the general meetings, and the presence of Professor Hare in the Section of Therapeutics. Nor must I neglect the honors that have been won during the lighter moments of the gathering, the palm for after-dinner oratory being carried off by Dr. W. W. Keen, of Philadelphia.

It is twenty-two years since an annual meeting was held in London, and the selection of the metropolis once again gave good excuse to the president (Sir Russell Reynolds) for various retrospective glances. Referring to the president of the gathering in 1873, he said, "I venture to say that if, like a well-known but not quite historic character, Sir William Fergusson could have fallen asleep about that time, and have not waked up until now, absolutely unconscious of the kind of progress made in surgery during these two-and-twenty years, and of the steps by which such progress was carried to its successful ends, even that dauntless surgeon might hesitate to perform an operation which either of his dressers of twenty years ago might be announced to do to-day, and would do without fear or dread." Turning to the medical side of our science, the president was very hopeful in his outlook, holding that there is scarcely any limit to what may be expected in the cure or prevention of disease, chiefly by the inoculation of various immunized serums. He mentioned "a recent communication of the greatest importance on the rendering of animals immune against the venom of the cobra and other snakes, which makes us all look forward with expectancy and hope to the possible and probable diminution of a great national and imperial calamity." This, of course, has reference to the experiments of Professor Fraser, published in the *Edinburgh Medical Journal* for July last.

The address of Mr. Jonathan Hutchinson in Surgery contained, *inter alia*, a well-merited stricture on the College of Surgeons for devoting so much of its space to "a collection of skulls and skeletons which has no connection whatever with our art. In place of a museum of clinical surgery we have a Golgotha of anthropology." Particularly worthy of attention, as coming from such an all-around surgeon as Mr. Hutchinson, is his defence of specialists and personal specialism, founded, too, as it is, on the frank confession of his own comparative failure in lithotrity and ovariotomy. "A man who thoroughly understands his subject in its details can treat it with an efficiency and ease which are wholly unattainable by others. To encourage specialism in many branches of operative surgery is, then, I cannot but think, in consonance with common sense and common humanity."

The address which will most certainly repay the most careful study in its entirety is that of Professor Schafer on Internal Secretion. It is full of the results of careful research, and is deeply suggestive and full of promise of the present trend of physiology and therapeutics.

Turning to the work of the sections, one was tempted to echo the cry of "*toujours perdrix*" in regard to the diphtheritic antitoxin. The various discussions, however, certainly contributed to affirm the value of the serum. There was little in the way of evil effects to record, while the statistical results of two foreign guests were more than encouraging. Professor Von Ranke, of Munich, gave his hospital mortality from diphtheria as 52.2 per cent. in 1892, 48 per cent. in 1893, whilst in 1894 up to the end of September it was 57 per cent. Since the introduction of the antitoxin in that month his death-rate has fallen to 17.7 per cent. Professor Baginsky, of Berlin, also reported a fall in mortality of from 41 to 15.6 per cent.

The germ theory was well to the fore, since in discussing rheumatism its microbial origin was inferred and pretty generally accepted, although not at present proved. Needless to say that this view was vigorously combated by Dr. Haig with uric acid explanation of affairs.

The question of the effects of the new conical bullets in gunshot wounds was placed in the experienced hands of Sir William MacCormac. His view was that these new missiles caused more disastrous results than the old round bullet. In the discussion of Tumors of the Thyroid Gland, Dr. Keen, of Philadelphia, quoted his observations during a recent visit to the Continent, which showed the possibility of operating without a general anæsthetic and the advantages of a transverse incision. The last day in the Section of Surgery was chiefly

devoted to the demonstration and discussion of Murphy's button. It was adversely criticised by several speakers and particularly by Harrison Cripps, who quoted cases to show, not the failure of the button to produce anastomosis, but the failure of the intestines to get rid of the instrument. Professor Macewen thought well of the button, but seemed inclined to reserve judgment.

In the Section of Obstetrics and Gynæcology the subject of antiseptics in private midwifery practice was once more debated. On the question of the surgical treatment of puerperal fever, Dr. Lusk, of New York, condemned curetting as "a most mischievous procedure." Anterior Colpotomy was discussed by Dr. Martin, of Berlin, who entered a plea for a more conservative treatment of the tubes in chronic inflammation.

In the special sections there was little of general interest to note. Pilocarpine as a remedy for nerve-deafness fell several points in general estimation. The question of the intra-cranial complications of chronic otorrhœa drew a masterly address from Professor Macewen, of Glasgow. It should be read in its complete form.

The slowness with which promotion sometimes arrives in our system of advancement by seniority is illustrated by the recent "elevation" of Dr. Lauder Brunton to a full physicianship at Bartholomew's. The name of Lauder Brunton is certainly anything but unknown, yet for twenty-five years his field of energy has been limited by the walls of the out-patient room. Indeed, this promotion has only occurred through the institution of an extra post, and it has been calculated that but for its creation Dr. Brunton might have reached the limit of age before he had been relieved from the drudgery of the ambulatorium.

Sir Joseph Lister has been presented by his pupils and former colleagues (for he has now retired from all hospital work) with his portrait. The occasion was certainly an historic one when that Nestor of surgery, Sir Eric Erichsen, made over the gift to his former pupil and house-surgeon. The position of teacher and pupil had, he modestly said, been long reversed, but he always gratefully remembered that the first glimmerings of the antiseptic principle saw the light in his wards. In his acknowledgment Sir Joseph (or the "grand old surgeon," as he is called by some of his followers) warned his audience against the fascinating but misleading idea of dispensing altogether with antiseptics and of finding a reliable aseptic dressing.

TAKA DIASTASE.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—I desire to say a few words in favor of the new remedy, taka diastase.

As a remedy for amylaceous dyspepsia it cannot be excelled. I have been afflicted with amylaceous dyspepsia for many years, and one dose of 5 grains never fails to relieve. Some two months ago I prescribed it for a man who has suffered with dyspepsia for ten years, he being compelled to sell his drug-store and quit all business on account of his dyspepsia, and today he is eating heartily of nutritious food, while before taking taka diastase he could not eat any kind of food without suffering as a result. He has now taken over one ounce of diastase, and he says it has surely saved his life. I have also used diastase successfully in the treatment of dysentery and diarrhœa in children. A few doses a day are sufficient to prevent fermentation of the bowel contents.

Yours truly,

E. L. WILKINSON, M.D.

VAN WERT, OHIO.

TRAUMATIC TETANUS. PROPHYLACTIC TREATMENT OF WOUNDS LIKELY TO INDUCE TRAUMATIC TETANUS.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—In an experience covering a period of forty years I have seen six fatal cases of traumatic tetanus. Four of the cases were due to *punctured* wounds of the hands or feet, one to *lacerated* wound of the foot, and one to compound fracture of the elbow. In the last case resection was resorted to, after the development of the tetanic symptoms, without favorable result.

Observing that no treatment seemed to be efficacious in arresting the fatal spasms after their inception, I came to the conclusion that the only course which held out any hope of success would be to try and *prevent* the production of the irritation of the spinal nerve-centres which caused the muscular contractions pathognomonic of this terrible affliction. Acting upon this theory, I have had an opportunity of testing it pretty thoroughly in six cases of punctured or lacerated wounds of the extremities similar to those which had led to fatal results in the six cases above referred to.

Treatment.—I applied either ice or cold water by irrigation to the wounded part immediately after the reception of the lesion, and

maintained the application for one week constantly, night and day. In every case the result was favorable. The application of cold to the lesion involving the distal extremity of the sensory nerve seemed to prevent the inflammatory condition, or the genesis of the tetanic microbe, which sets up by reflex action in the sensory motor centres of the spinal cord the characteristic condition that induces the fatal muscular tonic spasms, uncontrollable when once established.

To be successful, the treatment should be begun as early as possible after the reception of the lesion, and strenuously persevered with for one week, without ever allowing the temperature of the part to become elevated above the normal. I am at present treating a patient who is rapidly convalescing from a punctured wound of the foot occasioned by stepping on a nail about two weeks ago. Her whole weight was upon the point of the nail as she stepped down the stairs, and it penetrated the foot, coming out between the metatarsal bones of the great and second toes on the dorsal aspect. I applied ice broken in bits and inclosed in a towel about the anterior part of the foot, including the plantar and dorsal punctures, for one week. On discontinuing the ice I found some redness and tumidity about the instep and *dorsum* of the foot, and a dark, necrosed-looking spot surrounding the dorsal puncture. The plantar wound was entirely healed, and there was no tenderness on pressure there. The dorsum of the foot was congested, red, and tender on pressure, from injury to the parts traversed by the nail. I leeched, applied equal parts of tincture of iodine and tincture of belladonna, poulticed over the dorsal puncture, and directed the patient to keep the foot in hot water for hours at a time. Under this treatment the heat, redness, and tumidity is rapidly disappearing, and convalescence is far advanced. I never had so much trouble, and I attribute the congested condition of the foot to the fact that the nail passed entirely through the foot, inflicting injury to the bones, ligaments, muscles, and tendons in its path.

In the other cases of punctured wounds of the feet which I have treated the nails which caused the injury only went partially through. However, "all is well that ends well," and in a few days more my patient will be able to put on her shoes and stockings and resume her usual domestic duties.

I cannot say whether or not others have adopted the line of treatment here submitted for consideration, but I can confidently recommend a faithful trial of it, with the full conviction that it will prove as successful with others as it has in all the cases in which I have put it in practice. Of course it may be said that I have no right to adopt the *post hoc, propter hoc* form of reasoning. That may be so; but when exactly similar lesions in half a dozen cases induced *tetanus* and *death*, it is, I think, fair to infer that at least *some* of the six cases, if not all of them, treated from the first with cold applications, would have developed tetanic symptoms under other conditions. I hope I have not unduly taxed your valuable space, and that the results of my observations may prove of service to some of my younger medical brethren.

Yours truly,

E. GOODMAN, M.D.

ST. CATHERINES, ONTARIO.

A METHOD OF RESTORING PERSONS APPARENTLY DEAD FROM CHLOROFORM.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—It was very interesting to me to see in your issue of July 15, 1895, p. 413, a report of Dr. Leedham Green's paper upon a method of restoring persons apparently dead from chloroform. After I had seen the first two cases mentioned by Leedham Green I had a similar experience in the surgical clinic of Göttingen. I operated upon a man of eighteen years for ingrowing toe-nail. During the operation he suddenly became pale, pupils became widely dilated, and the pulse and respiration ceased. Compression of the præcordium was performed at once without any other measures being resorted to, except opening the mouth and pulling forward the tongue. The patient recovered very quickly, so that the operation was completed.

I afterwards had the opportunity of using the method in the following case: I was called to perform tracheotomy for diphtheria on a child of two years. On entering the room the child appeared dead, but I performed the operation as soon as possible, and then made a few compressions of the præcordium, with the result that the child revived and made a good recovery.

I wish to recommend this method very strongly to the profession. It is necessary that the compression of the præcordium be performed with considerable force and at the rate of about 120 to the minute.

Yours, truly,

F. MAAS, M.D.

DETROIT, MICH.

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A New Blood-Iron Albuminate : : : :

CONTAINS in a soluble form all the albuminates and salts (hæmoglobin, paraglobin, serumglobin, phosphates) present in the blood, without, however, any of the objectionable excretory products—fibrin, urea, etc.

A dark brown powder of a slightly acid taste, fairly soluble in cold water, and easily soluble in hot water without being coagulated. Furthermore, freely soluble in diluted alcohol, a most desirable property, since it renders its administration possible with alcohol-containing restoratives (as wines, etc.). It is perfectly stable, and one part corresponds to about six parts of fresh healthy bullock's blood.

May be specially recommended in cases where other iron albuminates have proved unsuccessful.

Dose:—Eight to sixteen grains, three to five times a day—preferably in gelatin capsules, or dissolved in warm water.

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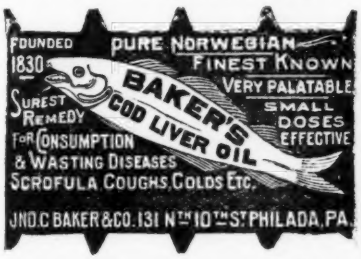

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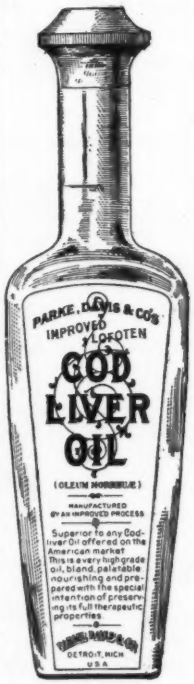
REYNOLD W. WILCOX, M.D.,
In *Maryland Med. Jour.*



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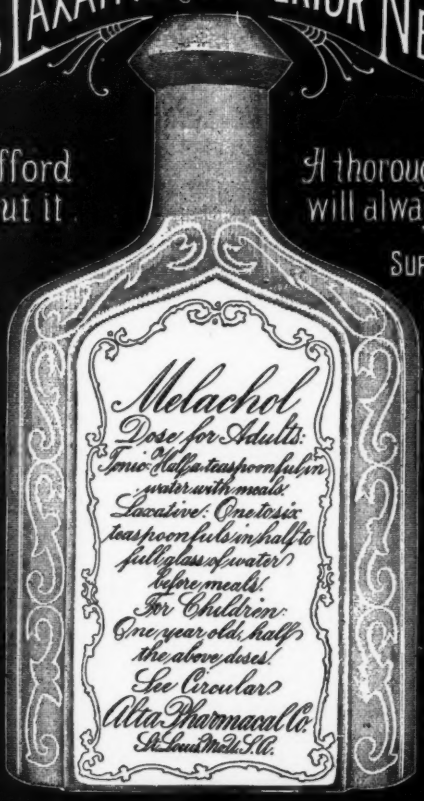
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